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REPORT OF ARCHAEOLOGICAL INVESTIGATIONS AT THE RIVER GLEN SITE --ETC(U)
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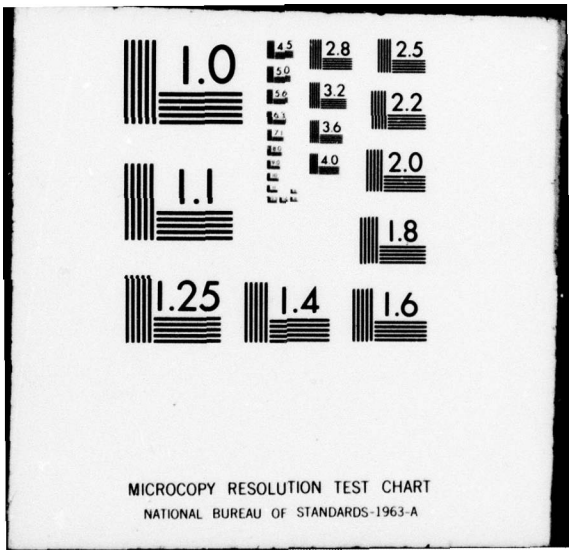
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LEVEL II

REPORT OF ARCHAEOLOGICAL ~~EXCAVATIONS~~ Investigations AT THE RIVER GLEN SITE (CA-NAP-261)

NAPA COUNTY CALIFORNIA

PREPARED BY
ARCHAEOLOGICAL CONSULTING
AND
RESEARCH SERVICES, INC.
FOR
U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT

JUNE 1978

411 071

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Archaeological investigations completed at site CA-NAP-261, located on the west bank of the Napa River to the north of the City of Napa have produced evidence of occupation at the site from perhaps as early as 3000 years B.P. and lasting, intermittently, until possibly as late as the early A.D. 1800's. The site has sustained considerable disturbance, induced both by man and by natural agents, especially rodently.

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Artifactual remains from the site are sparse, but when combined with the constituent materials from the midden, a apicture emerges of an aboriginal population which intensively exploited a highly localized resource base. Perplexing in this regard, however, is the minimal data suggesting a fishing industry. In fact, steelhead, a major food source for ethnographic populations is not represented among the faunal remains from the site.

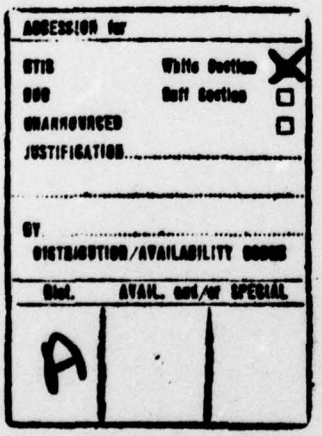
FINAL

REPORT OF ARCHAEOLOGICAL INVESTIGATIONS

AT

THE RIVER GLEN SITE

(CA-Nap-261)



Report of research submitted in partial fulfillment of Contract No. DACW07-77-C-0002 between the United States Army, San Francisco District Corps of Engineers and Archaeological Consulting and Research Services, Inc., Mill Valley, CA. Report written and edited by Thomas L. Jackson, Principal of Archaeological Consulting and Research Services, with contributions by R. Milliken, P. Schulz and D. Simons.

ABSTRACT

REPORT OF ARCHAEOLOGICAL INVESTIGATIONS
AT
THE RIVER GLEN SITE
(CA-Nap-261)

Archaeological investigations completed at site CA-Nap-261, located on the west bank of the Napa River to the north of the City of Napa have produced evidence of occupation at the site from perhaps as early as 3000 years B.P. and lasting, intermittently, until possibly as late as the early A.D. 1800's. The site has sustained considerable disturbance, induced both by man and by natural agents, especially rodents.

Two radiocarbon age determinations were obtained to date the base of the occupational layer. Sample I-10,046 yielded a date of 2505±95 years B.P. (555 B.C.) and sample I-10,047 yielded an age of 1965±170 years B.P. (15 B.C.). Sample I-10,046 was collected from the 70-80 centimeter level of the site, while sample I-10,047 was obtained at the 90-100 centimeter level. One hundred and fifteen (115) obsidian hydration samples were prepared which support the dates for the site suggested by the carbon samples. Thus, it is thought that major occupation at the site occurred between 1800 and 2800 years B.P. While some indication of a later occupational component at the site is indicated, it has apparently been destroyed.

Artifactual remains from the site are sparse, but when combined with the constituent materials from the midden, a picture emerges of an aboriginal population which intensively exploited a highly localized resource base. Perplexing in this regard, however, is the minimal data suggesting a fishing industry. In fact, steelhead, a major food source for ethnographic populations, is not represented among the faunal remains from the site.

Preface

Excavations at CA-Nap-261 probably typify much that has become standard course for those who operate in the realm of archaeology that has come to be called "cultural resource management". In many ways the project probably would never have been undertaken a decade ago. The site is disturbed and unassuming; not much is known for the area to easily place the site in some meaningful academic context; and the fact that the site may someday be destroyed to facilitate flood control efforts on the Napa River probably serves as the sole reason for its ever having been studied. Possibly, even this effort has been left incomplete.

Archaeological programs are invariably group efforts. Not just in terms of the collection of people who must be assembled to complete the various tasks, from digging to analysis, but in terms of the cumulative nature of the body of knowledge upon which archaeology as a whole must draw. To what degree our efforts at Nap-261, the site which we have elected to call the "River Glen" site, will be meaningful, we cannot know with certainty. We know that two radiocarbon age determinations have been obtained - tangible elements in an esoteric discipline. We know, too, that we have encountered two species of *Olivella* bead not previously reported to occur in the region. Thus, our contribution seems definable, if not valuable.

Archaeologists are people, and virtually all people are archaeologists in some manner of thought or action, and so we would like to acknowledge those archaeologists who have sought to understand a bit of the past, some 3000 years old perhaps.

Winfield Henn, now with the United States Forest Service, served as Field Director for the program, completing the necessary tasks involved in running the program, under trying circumstances, in fine form. The crew members, Katherine Davis, Cindy Desgranchamp, Alice Hall, Georgia Harden, John Holson, Michale Mannion, Joe Morris, Wayne Roberson and Greg White, worked efficiently and in the true manner of the professionals that they are. Cindy Desgranchamp was also responsible for the initial laboratory analysis which she completed in a most competent manner. To all these people we are most indebted.

Peter Schulz served on the field crew and also perpared the analysis of the fish remains from the site. Dwight Simons completed the analysis of bone, other than fish, recovered from the site. Both of these people have completed studies which will be important con-

tributions to the archaeology of the Napa region in and of themselves. We are privileged to have had their expertise contributed to the completion of the subject study. Pollen Research Associates did what was possible with the terrible pollen samples from the site. Soil conditions were not favorable for the preservation of palynomorphs but some data was forthcoming, nevertheless.

Dr. Bert Gerow, Department of Anthropology, Stanford University, generously allowed the use of obsidian hydration facilities at that institution in order to prepare the 115 samples used in this study. Dr. Gerow also assisted in the reading of some of the more difficult slides and provided helpful advice as needed. Mr. Joachim Hampel, as always, facilitated the completion of X-ray fluorescence spectrographic studies of the obsidian samples employed in this study. Work was completed at the Department of Geology and Geophysics, and to that department and its personnel we extend greatful thanks, as to Dr. Gerow.

Joan O'Donnell prepared the artifact drawings which add so much to this report and which make the communication of descriptive material so much easier, both for the author and, I am sure, for the reader. Her work has enhanced our reports for several years now and she seems only to improve in her skillful representations of artifactual materials.

Randy Milliken, a true scholar, prepared Chapter 2 of this report. It is our feeling that this portion of the report will stand as an important new historical and ethnographic contribution in California aboriginal studies.

Members of the staff of the United States Army, San Francisco District, Corps of Engineers, were instrumental in helping the completion of this contractual obligation. We extend our sincere thanks and appreciation to Mr. James Brown, Ms. Sue Fairchild and, especially, Mr. Ed Kandler for their help and kind assistance in all matters, large and small.

Finally, but certainly not least, Jennifer Anderson and Stephen Dietz assisted in the compilation and editing of this report in ways too numerous to mention but greatfully acknowledged.

The following personnel spent approximately these reported hours in the completion of their studies or other activities for this project:

Thomas L. Jackson, principal Investigator
B.A. (anthropology) San Francisco State Univ. 1971
M.A. (anthropology) San Francisco State Univ. 1974
Ph.D. (anthropology) Stanford University (in progress)

Task:		
	analysis of site materials and report preparation	28 days
	site visits, pre-field preparation, field support	11 days
	obsidian hydration analysis	7½ days
	X-ray fluorescence analysis	5 days
	cartography and illustrating for report	10 days
	typing	8 days

Peter Schulz, excavation and fish remains analyst
B.A. (anthropology) San Francisco State Univ. 1967
Ph.C (anthropology) Univ. Calif., Davis 1972
Ph.D (anthropology) Univ. Calif. Davis ABD

Task:		
	excavator	12½ days
	faunal analysis	5 days

Dwight Simons, Vertebrate Analyst
Ph.D (anthropology) Univ. Calif., Davis ABD

Task: vertebrate remains analysis 8½ days

R. Milliken, Ethno-historical research
M.A. candidate (landscape architecture) Univ. Calif. Berkekey

Task: Ethno-historical research 17 days

Joan O'Donnell, Illustrator
B.A. (anthropology) Univ. Calif., Santa Cruz 1972
Ph.D (anthropology) Univ. Calif., Berkeley (in progress)

Task: illustrator 8 days

Winfield Henn, Field Director
Ph.D. (anthropology) University of Oregon 1976 23 days
(Mr. Henn's duties were assumed by T. Jackson after Henn's departure; Jackson's time was billed at the rate agreed upon for Mr. Henn)

The following times were logged by fieldworkers (all have B.A. degree or higher, with previous archaeological experience)

Katherine Davis - 5 days	Herbert Roberson - 4 days	G. Harden - 14 days
John Holson - 14 days	Greg White - 15+ days	
Michael Mannion - 13 days	Cindy Desgranchamp 15 days	
Joseph Morris - 12 days	Alice Hall - 14 days	

Table of Contents

Table of Contents
(cont.)

Figures (cont.)

Maps

Plates

Table of Contents
(cont.)

Tables

Chapter 1

Introduction

Archaeological excavations at CA-Nap-261 (the River Glen site) were conducted under provisions of Contract Number DACW07-77-C-0002 between the Department of the Army, San Francisco District, Corps of Engineers and Archaeological Consulting and Research Services, Inc. Rationale for the undertaking of the archaeological research is set forth in Point Number 3 of the "Scope of Services" of the contract:

> General Background. The construction of the proposed Napa River Flood Control Project in conjunction with the local sponsoring agency, the Napa County Flood Control and Water Conservation District, would result in the complete destruction of Archaeological Site CA-Nap-261, Napa County, California. The Secretary of the Interior has determined that this site is eligible for inclusion in the National Register of Historic Places. In compliance with Executive Order 11593 and the recognized Procedures of the Advisory Council on Historic Preservation (36 C.F.R. Part 800), a Memorandum of Agreement between the San Francisco District, Corps of Engineers, and the California State Historic Preservation Officer and the Advisory Council on Historic Preservation was issued 21 April 1976, endorsing and outlining an appropriate and mutually acceptable program of excavation of the site as the most reasonable and practical measure for mitigation of the adverse effects of the proposed project.

Previous Archaeological Research

In 1967, Dr. David A. Fredrickson, currently of the Department of Anthropology, California State College, Sonoma, completed an archaeological survey of the area to be directly affected by the proposed Napa River Flood Control Project. The results of his survey are reported as, "Appraisal of the Archaeological Resources of the Napa River (Trancas Road to Edgerley Island) and Three Potential Reservoir Areas in the Napa River Basin" (Fredrickson 1967). Fredrickson's initial record of the site indicated its area to be on the order of, "225 by 300 feet, although original dimensions were probably smaller with enlargement caused by spreading associated with agricultural activities" (Fredrickson 1976:1; cf. Fredrickson 1967:9-10). A subsequent inspection of the site area by Moratto in 1974 found the area of the site to be disturbed in the years intervening between his and Fredrickson's 1967 study:

> The prune orchard which once existed on the site is now gone, and the surface is heaped with concrete rubble; a levee cuts across part of the site; a bulldozed cut along the eastern face of the site provides access to the river; and there is evidence of recent trenching for the placement of a large water pipe. In brief, the site has been extensively damaged by agricultural, flood-control, and land-fill activities (Moratto 1974:7).

A third visit to the site was made by Rosenson in November of 1975. After a brief initial visit to confirm the location of the resource, Rosenson reports:

> We returned to Nap 261 (*sic*) and continued to examine the surface scatter. It was decided that we would attempt to define the exact location and perimeters of the site by means of augering with four and six inch augers and screening with one-fourth inch rocker screens. We would utilize the existing survey markers, put in by the Corps as boundaries of the center line of the river, for our reference points. This way the corps (*sic*) survey crew could come back at a later date and plot in our work on the master plans.
>
> Six auger holes were drilled to an average depth of 50cm. and designated 261-1 through 261-6 (...). We began in the area labeled "archaeological site" on the blue line maps provided. However, it soon became apparent that the site had been spread out through agricultural and construction activities conducted in this area. ...
>
> An examination of the subsoil and recovered items indicated very little in the way of actual diagnostic archaeological data. However, by the end of the day we had determined that the site had been heavily disturbed to a depth of 30-40cm. in some areas. Tentative agreement was that Nap 261 (*sic*) would require further testing to ascertain the new dimensions and research potential of the site (Rosenson 1975:2-3).

The material recovered in the course of Rosenson's augering program is summarized as "Table 1," appended to his 1975 report. Rosenson apparently excavated a single test unit measuring one by one meter on the north edge of the site adjacent the river, but, his report does not

document that excavation beyond the tabulation of "Level Bags", apparently representing material recovered from arbitrary levels excavated in 20 centimeter increments (Rosenson 1975:"Table 2").

Excavations completed as part of the current contracted study have served to confirm Rosenson's conclusion that the uppermost 40 centimeters of the site deposit are thoroughly disturbed, at least in the area of excavations, and very probably over the entire general area of the site.

CA-Nap-261 is located approximately 750 meters downstream of Nap-14 (the Las Trancas site)(see Map 1) which was excavated between March 1 and 22, 1947, by members of the University of California (Berkeley) Anthropology 195 class. The results of the 1947 excavations are reported in Heizer (1953), as is a summary of archaeological research completed in the "Napa Region" to that date. A most comprehensive review of the archaeology of the Napa region has been offered by Fredrickson (1973) in his unpublished doctoral dissertation, *Early Cultures of the North Coast Ranges, California*. Another review of the literature and currently presumed relationships between archaeological cultures of the Napa region and other parts of central California will not be attempted as part of this report. Fredrickson's summary and discussions remain current and a duplication of that effort beyond the most brief summary and discussion to be offered at various points in this report seems unwarranted.

Environmental Setting

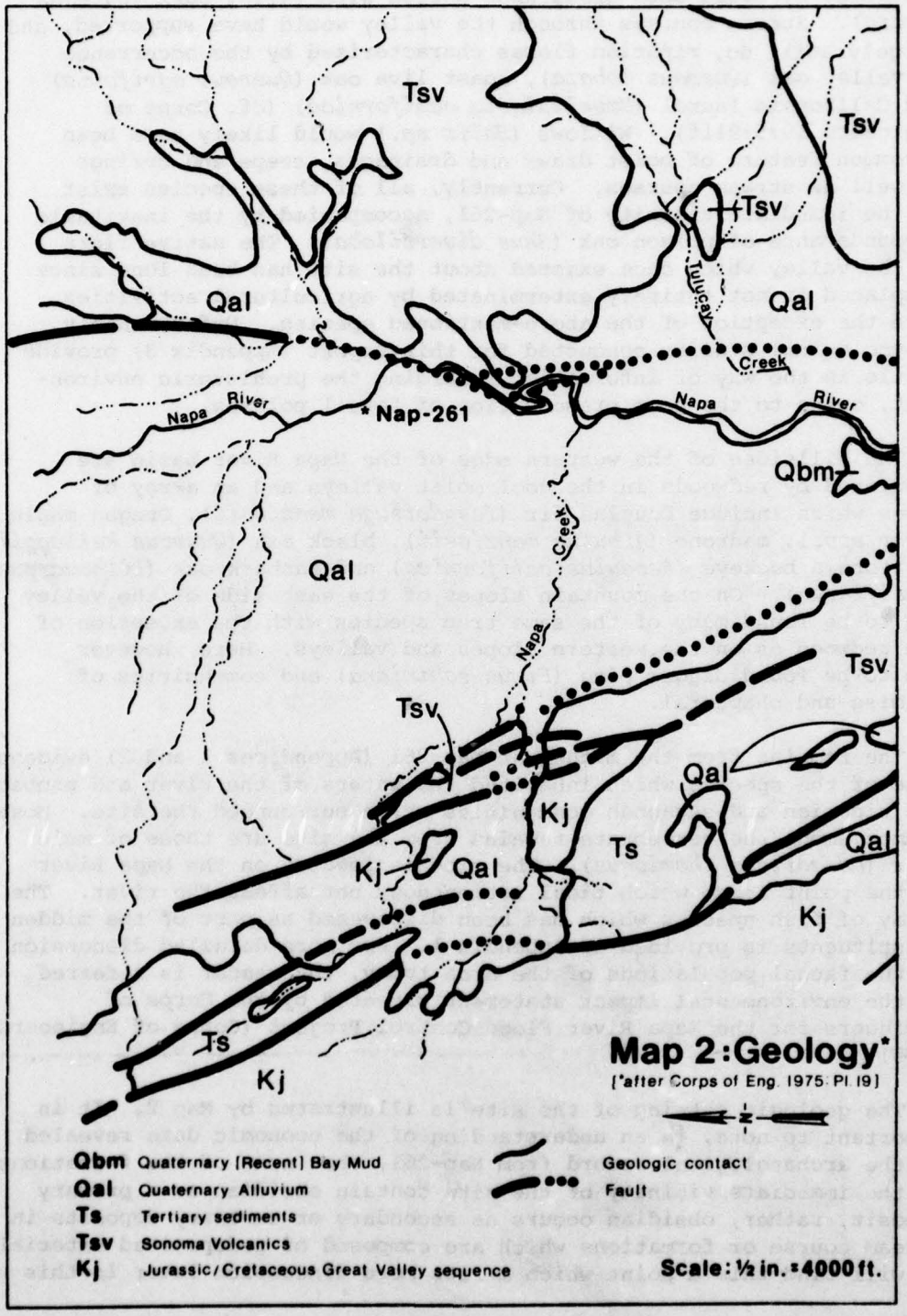
Heizer (1953:227-228) has provided a most succinct discussion of the "geographical background" of the Napa Valley area. Unfortunately, it is fraught with errors, but nevertheless suffices as an introduction to the climate and general physiography of the area. The Napa Valley is within the "Cool Summer Mediterranean" (Csb) climatic area (Russell 1926) and is characterized by a mean annual temperature of 57.6 degrees, receiving approximately 70% of annual rainfall in the period between December and March (Carpenter and Cosby, in, Heizer 1953:227). Heizer's characterization of the Napa Valley as being "completely within the Upper Sonoran life-zone" (p. 227) cannot be accepted, since the valley is clearly within the Lower Sonoran life-zone. Likewise, the Carpenter and Cosby (1938) discussion of the flora of the Napa Valley which is reproduced by Heizer (1953:227-228) cannot be accepted without modification, specifically, the Carpenter and Cosby claim that "Digger pine ... once covered the valley floor." Given the nature of the physiography and soils of the valley floor, this would be a unique and unprecedented habitat for that species. Indeed, the valley floor of aboriginal times is more likely to have been populated by the typically Californian oak savannah flora

dominated by broad open grasslands dotted with valley oaks (*Quercus lobata*). Stream courses through the valley would have supported, and largely still do, riparian floras characterized by the occurrence of valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*) and California laurel (*Umbellularia californica*) (cf. Corps of Engineers 1975:91ff). Willows (*Salix sp.*) would likely have been a common feature of moist draws and drainages, seeps and springs as well as stream courses. Currently, all of these species exist in the immediate vicinity of Nap-261, accompanied by the inevitable preponderance of poison oak (*Rhus diversiloba*). The native flora of the valley which once existed about the site has been long since displaced if not entirely exterminated by agricultural activities with the exception of the above-mentioned species. Unfortunately, palynological studies conducted for this report (Appendix 3) provide little in the way of information regarding the prehistoric environment, owing to the poor preservation of fossil pollens.

The hillsides of the western edge of the Napa River basin are populated by redwoods in the cool moist valleys and an array of trees which include Douglas fir (*Tseudotsuga menziesii*), Oregon maple (*Acer spp.*), madrone (*Arbutus menziesii*), black oak (*Quercus kelloggii*), California buckeye (*Aesculus californica*) and tanbark oak (*Lithocarpus densiflorus*). On the mountain slopes of the east side of the valley are to be found many of the same tree species with the exception of the redwood as on the western slopes and valleys. Here, however are to be found digger pine (*Pinus sabiniana*) and communities of chamise and chaparral.

The remains from the midden at Nap-261 (Appendices 1 and 2) evidence some of the species which inhabited the waters of the river and probably the riparian and savannah communities which surrounded the site. Most common among the vertebrate remains from the site are those of mule deer (*Odocoileus hemionus*). The site is located on the Napa River at the point above which tidal action does not affect the river. The array of fish species which has been discovered as part of the midden constituents is provided as Appendix 1. For more detailed discussion of the faunal populations of the area today, the reader is referred to the environmental impact statement prepared by the Corps of Engineers for the Napa River Flood Control Project (Corps of Engineers 1975).

The geologic setting of the site is illustrated by Map 2. It is important to note, in an understanding of the economic data revealed by the archaeological record from Nap-261, that none of the formations in the immediate vicinity of the site contain obsidian as a primary deposit, rather, obsidian occurs as secondary or tertiary deposits in stream course or formations which are composed of redeposited materials. We will find this a point which merits more discussion later in this study.


Tsv
Tsv
Tsv
Qal
Qal
Tulucay
Creek
Napa River
* Nap-261
Napa River
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Kj
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Map 2: Geology*
[*after Corps of Eng. 1975 Pl 19]
Qbm Quaternary [Recent] Bay Mud
Qal Quaternary Alluvium
Ts Tertiary sediments
Tsv Sonoma Volcanics
Kj Jurassic/Cretaceous Great Valley sequence
Geologic contact
Fault
Scale: ½ in. = 4000 ft.

Ethnographic Setting

CA-Nap-261 would appear, on the basis of available ethnographic data (specifically Driver 1936 and Bennyhoff 1977) to be located within the bounds of the historic Wappo territory. This remains, however, a point for discussion and investigation and is one of the points which the excavations at Nap-261 might address. Chapter 2 of this report will discuss the ethnohistory of the lower Napa Valley in considerable detail and in a manner more relevant to the actual work undertaken.

Driver's (1936) ethnographic data for the Wappo has been summarized in Heizer (1953). The already minimal information which Driver was able to gather about Wappo culture has been combined with that for the Patwin by McClellan (in, Heizer 1953:233-243) and presented as the "ethnographic background" for the *Archaeology of the Napa Region*. Chard (in, Heizer 1953:244-246) has further abstracted the ethnographic data for the Patwin and Wappo for a discussion of material culture aspects of the two cultures as they may be applied in the analysis of the archaeological record of the Napa region.

It can be of no service to provide yet another "summary discussion" of Wappo and Patwin ethnography for this report. Rather, the reader is encouraged to utilize the available sources (for example, Barrett 1908, Driver 1936, and Kroeber 1925 and 1932) in conjuction with Milliken's discussion of the lower Napa Valley in Chapter 2 of this report. Ethnographic data, as it is found to be applicable, will be brought to bear in the discussion of the archaeological remains from the River Glen site.

Present Studies

Field operations for the present study were begun on October 19, 1976, under the supervision of Dr. Winfield Henn. A total of 16 excavation units were initiated, 13 one by two, and 3 one by one meter units. Methodological and research concerns will be discussed in Chapter 3 of this report. Field studies were terminated by order of the Corps of Engineers on November 5, 1976. Laboratory and special studies completed for the excavated materials from Nap-261 will be the focus of discussion in chapter 4 and subsequent chapters of this report.

Chapter 2

Ethno-History of the Lower Napa Valley*

This paper explores the various sources of information regarding the aboriginal peoples living in the lower Napa Valley at the time of the Spanish arrival. This includes the recollections of the descendants of those people, and the accounts of the earliest Hispanic and Anglo explorers and settlers. Analysis of the records of the Franciscan missions provides new data on political, social and cultural relationships at the contact period. This discussion provides a historical context for the analysis of the data retrieved from CA-Nap-261.

Some Ethnographic Sources

Fredrickson (1967:3) describes the current perception of the linguistic relations in the lower Napa Valley at the time of initial contact with European culture as follows:

> ... the northern portion of the Napa River Basin was claimed by the Wappo Indians, a Yukian-speaking group with closest linguistic relatives located a considerable distance to the north in a more remote portion of the North Coast Ranges of California. The southern portion of the Napa River Basin was claimed by the Southern Patwin, a Penutian-speaking group. Members of the Penutian language family occupied almost the entire Interior Valley of California and the adjacent foothills. The boundary between the Wappo and the Patwin in the Napa River Basin is believed to have been situated somewhat north of the confluence of Napa Creek and Napa River in the present city of Napa.

These terms, "Wappo" and "Patwin" do not apply to any political group *per se* in existence at the time of initial contact. Political organization was based upon tribelets, described by Kroeber (1932:258) as, "groups of small size, definitely owning a restricted territory, nameless except for their tract of land or best known spot, speaking usually a dialect identical to their neighbors, but wholly autonomous."

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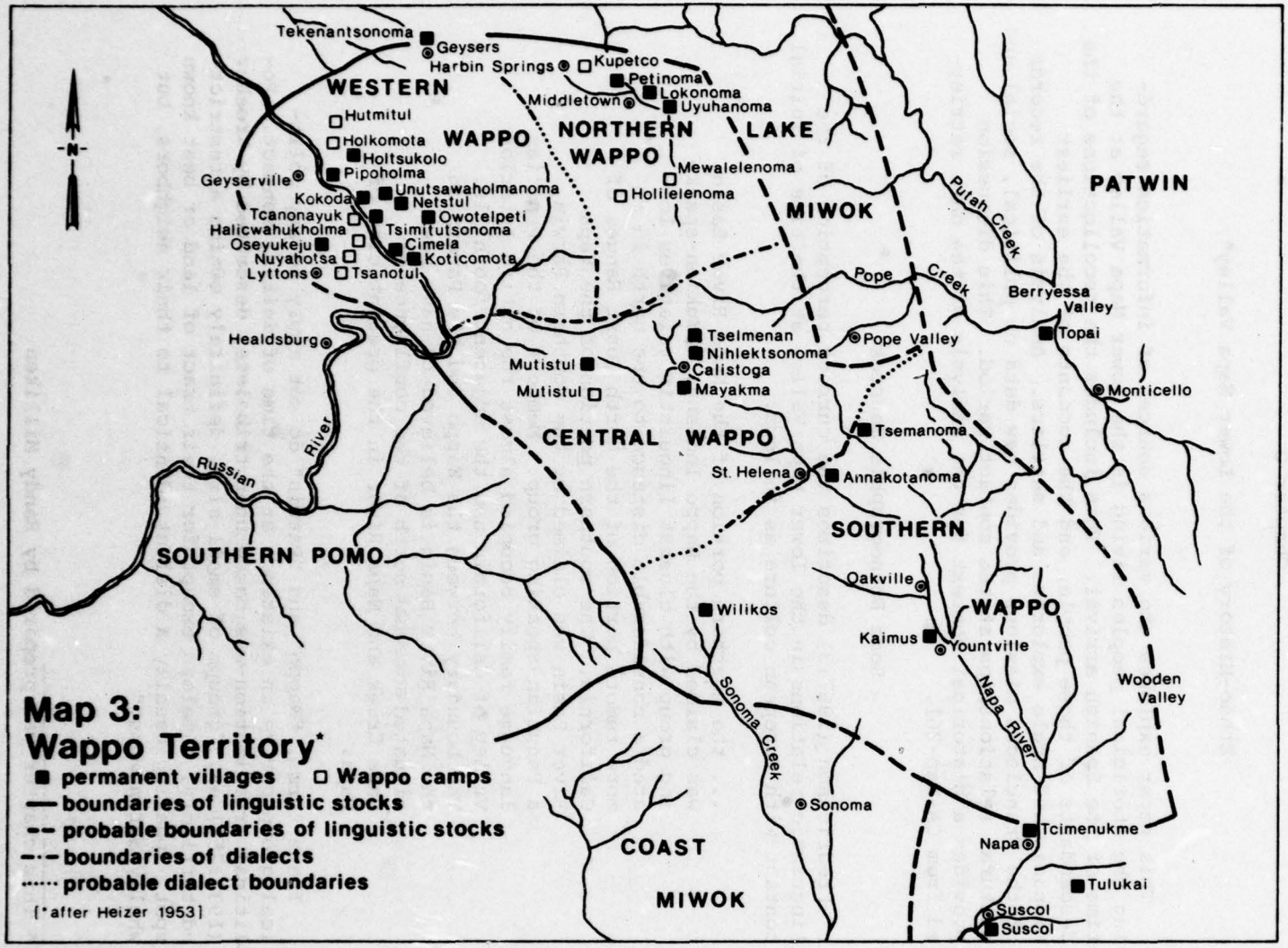
* This chapter was prepared by Randy Milliken



Map 3:
Wappo Territory*

■ permanent villages □ Wappo camps
— boundaries of linguistic stocks
-- probable boundaries of linguistic stocks
-·- boundaries of dialects
····· probable dialect boundaries

[*after Heizer 1953]

The first non-Indian settler in the Napa Valley, George C. Yount, described the people he found there:

> The Indians of the Napa Valley. Twenty-five years ago there was not a white resident in the Valley. The only inhabitants were Indians, of whom there were 6 tribes. The Mayacomas (pronounced Mi-a-comas) dwelt in the vicinity of the Hot Springs, in the upper end of the Valley; The Callajomanus (Cal-ya-ho-ma-nas) had their home on the land known as the Bale ranch; the Caymus (ki-moos) tribe occupied the tracts now owned by G. C. Yount; the Napa Indians inhabited the Salvador Vallejo ranch of Entre Napa--that is, the place between Napa River and Napa Creek; the Ulucas (Oo-loo-cas) lived on the east of the river in the vicinity of the present town site; and the former domain of the Suscol Indians, afterwards known as the Suscol Ranch, became the property of M. G. Vallejo. These tribes spoke different dialects, and were almost constantly at war with each other. Their rancherias were numerous throughout the length of the Valley, being built on the banks of streams, or near springs (reprinted from the "San Francisco Weekly Bulletin" of May 20, 1860, in, Heizer 1953:312).

Yount repeats this information in his published memoirs and adds the following:

> Limits of territory of each were distinctly marked, it was a capital offence for an individual of one tribe to transgress and infringe upon the territory of another (Yount 1923:3).

Land Grant Names

The above-named "nations" may probably be equated with the tribelet groups as defined by Kroeber. Many of these names have been applied to the Mexican land grants given in the 1830's and 1840's. The territories of these ranchos are listed below, since they seem to indicate the location of the tribelet groups.

"Suscol". This rancho, granted to M. G. Vallejo in 1843, was on the east side of the lower Napa River from Vallejo and Benicia, north through the present Suscol to Twin Sisters Peak.

"Tulucay". Bordered on the south by Rancho Suscol, this rancho

extended through the land of the State Hospital north to Sarcos Creek on the east side of the Napa River. The Tulucay grant was awarded to Cayet. Juarez in 1841.

"Entre Napa". Granted to Nichola Higuera in 1836 by Governor Pico, this rancho extended west of Tulucay, from Carneras Creek north to Napa Creek.

"Napa", alias "Trancas y Jalapa". Salvador Vallejo received this grant in 1838. The grantee stated that the nickname "Trancas" derived from the heavy gate of redwood poles in front of his home. Jalapa is the Mexican term for the morning glory plant. The bounds of this grant lay on the west side of the Napa River north toward Yountville.

"Yajome" alias "Paso de las Trancas". This grant is on the east side of the Napa River, from Sarcos Creek north toward Yountville. Granted to Damasio Rodriguez in 1841.

"Caymus". The Yount grant of 1836 was the first in the Valley. The land surrounds the present town of Yountville.

"Carne Humana". Granted in 1841 by Governor Alverado to the American-become-Mexican citizen, Dr. Edward Turner Bale. The lands of the rancho had been known by various Indian names: *Huilac Nama, Caligomana, Kolijohnanok* (cf. Heizer 1953:232, "Calajomanas" or "Kolijolmanok"; cf. Cowan 1956:24, "Colijolmanoc"). To the wonderment of his neighbors, Bale redesignated the lands as "Carne Humana". The grant lay in the northwest part of the county along both banks of the upper Napa River.

If we assume that Tulucay is synonymous with Ulucas, we have a tentative area placement for all of the "nations" mentioned by Yount; the Hot Springs location of Mayacomas being around Calistoga. An additional Indian name, "Yajome", appears in this list. The grantee of the land, Damasio Rodriguez, stated that he, "has been in possession of a place called in the language of the wild Indians Llajome (Land Grant Case 39ND:18)."

Care must be taken in assuming the coincidence of tribelet areas with so-named Mexican land grant boundaries. To the east is the Tolenas Rancho, covering a large territory from Fairfield to the south and east. A small neck of this ranch ran along the northern boundary of Rancho Suisun to the Gordon and Suisun Valleys. Hendry and Bowman (1945) state that the town of Chief Solano of the "Suisuns" was in Suisun Valley at the center of section 6, T5N, R2W, on the east side of Suisun Creek. From Solano's rancheria upstream the creek was called "Tolenas". The vast Tolenas holdings to the south

and east are probably named after this distant area, especially since the first house of the grantee of Tolenas, Don Armijo, was in this "Tolenas" creek area.

Ethnographic Researchers

Many of the linguistic groups of California were first described and named by Stephen Powers. The following information on the Patwin group was received from Antonio, chief of the "Chen-po-se" at Cache Creek:

> In Long, Indian, Bear and Cortina Valleys, all along the Sacramento from Jacinto to Suisun, inclusive, on Cache and Puta Creeks, and in Napa Valley as far up as Calistoga, the same language is spoken, which any Indian of this nation can understand.
>
> The various tribes are distributed as follows: In Napa Valley the Napa; on the bay named after them the Su-i-sun', whose celebrated chief was Solano. *In Lagoon Valley were* the Ma-lak-ka; on Ulatus Creek and about Vacaville the Ol-u-la-to; on Puta Creek at the foot-hills the Li-wai-to. (These last three names were given to me by a Spaniard and I could find no Indians living by whom to verify them, except that the aboriginal name of Puta Creek was Li-wai) (Powers 1877:218).

The first thorough collection of ethnohistorical material on the Napa Valley was done by Dr. S. A. Barrett. He places a town called "Tu'lūkai" about two and one-half miles southeast of Napa City. He believes that it is the same as the "Ulucas" mentioned by Yount. He also indicates a town called by his Wappo speaking informant "Tchiminukme" in the northern area of Napa City. These villages were occupied by Patwin-speakers.

Barrett (1908) discounts Powers' information that the Patwin language was spoken north to Calistoga in the Napa Valley. His informants reported that the Wappo language was spoken as far south as the tide-water on the Napa River, or a point just above Napa City.

On July 9, 1906, Dr. C. Hart Merriam interviewed a Patwin-speaking man named Philip, who lived near Glen Ellen, Sonoma County. Philip stated that at least three languages were spoken in the Napa Valley:

1. Too-loos-too-e from Suscol up to Napa. There was a Too-loos-too-e rancheria of Ki-e-tan-nah near Napa. (The Too-loos-too-e, I am told by another informant, were Win.)

2. Wi-ye-lah (Wi-e-lah). At and near Yountville and north to about St. Helena. Language entirely different from Too-loos-too-e. Old chief Caymus (Ki-mus).

3. Mi-yah-kah-mah. Head of valley about Calistoga. Language wholly different. (Merriam 1967:270)

Merriam implies that the "Too-loos-too-e" are part of the "Poo'-e-win" tribe which extended from Sonoma to the Sacramento River, including the "Soo'-e-soon" people of the Fairfield area.

Two days later Dr. Merriam interviewed an old Indian man named Jim, who had been born in Napa. Jim indicates that the tribe at Yountville and St. Helena spoke the same language as the "Mi-yah-kah-mah" of Calistoga. Jim said that the "Nap-pah" and "Too-loo-kai" were "Poo'-e-win" rancherias near together in the Napa Valley. An old Spaniard named Ki-tai'-nah Juarez took possession of the Too'-loo-kai rancheria, at the site of the State Hospital. (This was Cayetano Juarez, the grantee of Rancho Tulucay, and it indicates that the "Too-loos-too-e" rancheria of "Ki-e-tan-nah" mentioned by Merriam's informant Philip is the same as "Too-loo-kai".)

Jim indicated that the "Poo'-e-win" lived from Sonoma to "Tulukai" to "Ol-ulata"*, then northeast to Winters and Woodland. The people north of this line, which seems to include Tulucay itself, were called by these "Poo'-e-win" the "Too-loos-too-e. Jim says they were the "Nan'-noo-ta'-we" and that they were "Win".

This entire confusing entry seems to deal with the attempts of the informants to explain the relation of tribelet groups to dialect groups within the Patwin language family. It is important because "Poo'-e-win" probably means "eastern speakers" ("Pu", being the Patwin word for "east"; "win", meaning "speakers") (Barrett 1908:85). It indicates either a close relation of the southernmost Patwin with the Winters and Woodland people, or the settlement of easterners in the Napa and Sonoma Valleys in the recent past.

Elsewhere in his notes, Merriam states, "The Indian family on

*Merriam understands this to be near Fairfield. It is, however, definitely Vacaville.

Bayle's ranch in lower Napa Valley were Poo'e-win. They have been called Callejamanes and Canaumanos" (Merriam 1967:272). Here may be support for Powers' conclusion that the Wappo language ended at Calistoga, in contradiction of Merriam's other information about the Yountville and St. Helena people speaking the same language as the Calistoga people. If accepted, it would explain Yount's (1923: 55) reference to "five distinct nations, no two of which could converse together...without an interpreter..."

The information that Kroeber includes in his Handbook of the Indians of California is derived from the shaky information discussed above. Both the accurate information and the misunderstandings of Merriam and Barrett are carried into that work.

The most recent synthesis of evidence about the people of the lower Napa Valley has been offered by Heizer (1953). This study includes a well researched but speculative discussion of the original meaning of the Indian words surviving on the maps of Napa County, written in 1931 by Father McKeon, the Catholic pastor of Calistoga (Heizer 1953:312-314). Heizer's "Map 1," which synthesizes the data of the early ethnographers, is abstracted and included herein as Map 3.

Research to date leaves a bewildering assortment of names for rancherias, groups and dialects. There is little evidence for any but general statements about tribelet locations and language bounds. Neither do we have much sense of the way of life and relationships of the peoples themselves. Given this absence of information, there is a great temptation to extrapolate ethnographic material from the nearest better-studied group of the same linguistic affinity.

Although Kroeber recognized the lack of functional reality of the formulated California language groups, he argued that a group which shares a language must share a history, culture and philosophical concepts (Kroeber 1925). This argument simplified the study of an incredible mix of cultural, ecological, and linguistic units allowing cultural assignments and explanations within vast territories in which all sense of culture history had been lost. If the people of an area spoke the same language of any single tribelet which had been studied, they are then assigned to the same "non-political ethnic nationality" and therefore shared a culture. The validity of this approach may be questioned.

Although the Wappo of Alexander Valley provided ethnographic information to Driver (1936) and the Southern Patwin of Colusa have been described by Kroeber (1932), it may be a mistake to assume that these descriptions apply to the Wappo-speaking and Patwin-speaking groups which seem to border one another somewhere in the area of

Nap-261.

Kniffen (1939) describes the radical lifestyle differences among Pomo-speaking groups of the coast, valley and Clear Lake ecological zones. Neighboring groups in a similar ecological situation are likely to share many cultural features, especially those related to physical maintenance. They are also likely to retain characteristics of parent groups with whom they are related by language. Given the limited sample of ethnographic data for north Central California groups other than Pomo, the relevance of either the Driver study of the Alexander Valley Wappo or the Kroeber study of the Colusa Patwin to the Napa Valley will emerge only with the development of a stronger model of change through time in the Alexander Valley, Colusa and Napa areas as provided by the archaeological record.

Some immediate questions arise from a review of the ethnographic and ethno-historical literature of the Napa Valley:

1. Do the "nations" remembered by George Yount represent the tribelets living in the Napa Valley at the time of Euro-American settlement?

2. Do the Mexican land grants cover the same territory as the tribelets for which they are named?

3. Could the groups living at Tulucay or Soscol be arrivals from elsewhere, retained as laborers on the ranchos?

4. Did the Las Trancas vicinity (i.e., that of Nap-14 and Nap-261) lie within the lands controlled by Wappo- or Patwin-speaking peoples?

5. Does the Wappo-Patwin boundary constitute a definable ethnic boundary at any point in time?

North Bay Ethnography

Mission Records

A major source of information about the Indian peoples of the North Bay at the time of Spanish contact are the records of the Franciscan missions. Each person baptized at a mission received a Spanish name and a unique entry number in the *Libro de Bautismos*; the date of baptism, the person's given name, sex, age, and the names of the god-parents were recorded. Close relatives were also often recorded in an entry, by name, number or both. In most cases

a group of origin was also included. The first entry in the *Libro de Bautismos* at the mission of San Francisco de Assis was Francisco Soto. Because he is the child of Spanish parents, the title "Gente de Razon" accompanies this entry. All Indians were considered "gentiles" before baptism and "neophytes" afterwards. The first gentile to be baptized in the Bay Area was entry number seven at San Francisco de Assis, 22 year-old Chamis of "Chutchui" (Outer Mission area of modern San Francisco).

Each of the missions active in the Bay Area followed the same procedure for recording batisms. Marriages were also recorded by unique numbers in the *Libro de Casamientos*. Every death of a Catholicized person was recorded in a seperate *Libro de Difuntos*. These books are now in the care of the Catholic Archbishop's Office in San Francisco, with the exception of those for Mission San Francisco Solano, which are in the care of the Bancroft Library, University of California at Berkeley. An alphabetized register of people of Mission San Francisco de Assis in 1822 is also at the Bancroft Library. This register will be referred to hereinafter as the *Padron*.

Revised Baptismal Counts

The linguist Alphonse Pinart copied lists of Indian names from the mission records in 1880. He drew no conclusions from them which were ever published. In 1919 Stella R. Clemence compiled, under the direction of C. Hart Merriam, a listing of the rancheria names present in the records of all of the missions. These lists have been published elsewhere (Merriam 1955; 1968; 1970).

Of the six "nations" mentioned by Yount, only the Napa, Caymus, Callajomanus and Mayacomas have recognizable counterparts on these mission lists. Suscol and Tulucay are absent. There is a group called Yaujome at Mission San Rafael. Many familiar North Bay placenames appear in the records, among them, "Karkin" (Carquinez), "Petaluma", "Sonoma", "Suisun", "Tolena" and "Ululato" (Ulatis).

The Clemence lists were not meant to give accurate information as to the number of Indians baptized from a given tribelet. For instance, on May 5, 1812, Father Abella wrote at the end of a series of 23 entries, "*Totdos son Suisunes, a excepcion de los tres que ia se expresan sus Rancherias.*" (San Francisco de Assis baptisms #4494-4517). #4494 is from "Napa". #4508 and #4510 are "Caguapatto". The rest of the group a "Suisun". Seeing the rancheria name "Suisun" once in the last, Clemence recorded a single Suisun entry. Clemence's total of entries for Suisun is 94. Revised counts indicate that 301 Suisuns were baptized.

Table 1 offers a revised count for the baptisms of groups which are presumed to be from the North Bay. Many names are generally recognizable. Others, including "Omiomi" and "Alaguali" are placed by intermarriage with known North Bay groups. Only those groups with batisms of 100 or more are included.

Mission Records and Inter-group Marriages

The mission records mention a bewildering number of tribelet groups. Some of these tribelets, never mentioned by later informants, can now only be placed geographically by inference. Inter-group contact is indicated by the recorded marriages between individuals of different tribelets. It is assumed that, in general, the closer that the two tribelets are to one another geographically, the more likely it is that marriages will be contracted between them.

This technique was applied to the Plains Miwok groups by Dr. James A. Bennyhoff (1977). He tentatively placed tribelets on the basis of marriages between individuals indicated in the Pinart translation of the Mission San Jose *Libro de Bautismos*. Almost all such marriages mentioned in batismal records would have been contracted in the pre-mission situation.

The Franciscan priests, however, seem to have only haphazardly included marriage information in these *Libros de Bautismos*. An analysis of inter-group marriage from such books may under-represent some inter-tribelet ties. For this reason the present analysis makes us of the *Libros de Casamientos*, which recorded all marriages recognized as legitimate by the priests.

For the purposes of statistical correlation it is necessary to distinguish between marriages which had been contracted in pre-mission situations from those taking place among persons that had been at the missions for a period of time. In the latter case there are many marriages, especially among widows and widowers, of persons from tribelets separated by great distances; persons very unlikely to have married under pre-mission circumstances. Due to the limitations of time, this exploratory analysis has not differentiated these two important marriage categories. For want of "clean data" statistical correlation analysis will not be presented.

The inter-marriage data provided in Tables 2 and 3 can, however, be considered "safe" enough to draw tentative conclusions about tribelet proximity and marriage networks. We may assume that pre-mission alliances tended to be maintained, at least initially, within the mission rancherias. Upon visiting Mission San Francisco de Assis and Mission San Jose, Langsdorff (1814:195) stated that,

Table 1: Baptism Dates for Major North Bay Groups

	Omiomi		Olompali		Petaluma		Alaguali		Chocuyen		Napa		Canicaymo		Tolena		Suisun		Ululato		Karkin	
Year	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ	SF	SJ
1810	16										3						19				48	
11	142						2										68					
12	21						6				6				9		57					
13	7						2								0		3					
14	19		3		12	27	2		8		7	25	7		1		6				1	
15	0		0		1	3	3		35	72	31	123	2		1	1	120		8			
16	16		45	6	36	45	21	67		16		7	2			35	20		0			
17	15		0	198	11	13	13	2				2				17	2		3			
18			*8	1	*2	3						4		2		1	3		0			
19			*1		*3											15	3		0			
1820					*7											65	1		2			
21					*19					1			240				1		256			
22			*1		*3														32			
23					Son					Son				Son		Son		Son		Son		
24					10									13		1				27		
25										3				26						3		
26														12				2		4		
27														35						3		
28														15		1						
29																						
1830																					(+100)	
Total	236		263		195		118		135		212		354		147		305		337		149	

Notes: "SF" columns refer to baptisms at Mission San Francisco de Assis; "SJ" columns refer to baptisms at Mission San Jose; "Son" columns beginning in 1823 refer to baptisms at Mission San Francisco de Solano; * indicates baptisms at Mission San Rafael; The counts for San Francisco de Solano and San Jose are exact counts from microfilms of the original *Libros de Bautismos*, as are those for San Francisco de Assis for 1810-1817. The San Rafael counts and the Ululato count at S. F. Assis are from Clemence (Merriam).

Table 2: Marriages among Groups from the North Bay and Their Neighbors, 1810-1817*

	Group	Total Bapt.	1 N	2 E	3 S	4 W	5 Ala	6 Cho	7 Cho	8 Cho	9 Chu	10 Chp	11 Gel	12 Hab	13 H-A	14 Hch	15 Kar	16 Nap	17 Olm	18 Omi	19 Pet	20 Pus	21 Sac	22 Sus
1	North																							
2	East																							
3	South																							
4	West																							
5	Alaguali	118				1																		
6	Chocuay	57	1			2	2																	
7	Choquinico	23					1																	
8	Choquoime	89					3																	
9	Chocuyen	46	1				2																	
10	Chupcan	120			+																			
11	Geluasibe	40				6	3	5																
12	Habasto	100				21							1											
13	Huch.-Aguasto	80				6						2		1										
14	Huchiun	394			+	8	1					2		5	8									
15	Karkin	149			2	1						3			7	9								
16	Napa	212	1			1	2			4	1	3		1	4		2							
17	Olompali	263				7	3			1														
18	Omiomi	236				32	4	1				1	4	7	2	1	1		2					
19	Petaluma	195				4	4	1		2			1						3	1				
20	Puscuy	33				1		4	2				4							2	1			
21	Saclan	150			+	2		1				+		1	1	+	+	1		1				
22	Suisun	303	3		3	3					1	15					2	2		1				
23	Tolena	147		3						1							3	3						3

+= strong intermarriage

1 North= Canicaymos
(Canijolmano)
(Caymus)
(Guiluc)
(Mayacma)

2 East= Chemoco
Malaca
Puttato
Soneto
(No Ululato)

3 South= Yrgin
Tatcan
Volvon

4 West= Costa
Gualen
Huimen
Olema
Tamal

(* From *Libros de Casamientos* at missions San Jose and S. F. de Assis)

Table 3: Marriages among Groups at Mission San Francisco de Solano, 1823-1832*

	1 Wes	2 Lic	3 Pet	4 Cho	5 Nor	6 Can	7 Cay	8 Hui	9 May	10 Alo	11 Loa	12 Sou	13 Kar	14 Nap	15 Tol	16 Eas	17 Che	18 Lib	19 Mal	20 Put	21 Son	22 Sui	23 Top
1 West -				Huimen				Huimen							Tamal								
2 Licatiut																							
3 Petaluma	1	1																					
4 Chocuyen		1	4																				
5 North -						a	Oleomi	b		c													
6 Canijolmano			1	2	2																		
7 Caymus			1	5	1	4																	
8 Huiluc	1		5	7		6	8																
9 Mayacma				3	1	2	4	10															
10 Alaquiome				1		3	5	1	2														
11 Loaquiome				1	3	3	1	2	3	4													
12 South -				1									Saclan						Yrgin				
13 Karkin						3	1			1		1											
14 Napa				1			1	1	1														
15 Tolena	1		2	1		2	3	1	2	2	1			2									
16 East -																							
17 Chemoco							1	1		1			1		3								
18 Libayto													2				1						
19 Malaca												1											
20 Puttato				1						1				1	2		1	1					
21 Soneto																	2	1					
22 Suisun										1		1	3	1	3			8		5			
23 Topayto							1	1		2							1						
24 Ululato												1					1	6	9		1	4	

(* A large number of couples whose marriages had been recorded at Mission San Jose and Mission San Francisco de Assis helped to found the Solano mission. They are included in the Solano records as are the marriages performed at Solano. Both are counted above.)

a= two Utsonoma b= one Coyoyomi c= three Atenomac

"... the fathers never can prevail upon them to to intermarry with each other. They will unite only with those of their own tribe, and do not mingle in the society of the other tribes but with a certain reserve."

The longer that a group remained at the mission the more frequently its members married into previously non-allied groups. This may be partially explained by the breakdown of the old culture, but the lack of appropriate marriage partners due to the high mission mortality rate may also have been a factor in this increased exogamy.

The marriage counts in Table 2 are taken from the *Libros de Casamiento* at Mission San Jose and Mission San Francisco de Assis to the end of 1817. We may assume that it will not show much distortion of pre-mission inter-marriage patterning for the most recently arrived North Bay tribelets. The possibility of distortion increases for the relationship of those groups to the south and west of the Napa region which had arrived at the missions at an earlier date*.

Further analysis of the source books for Table 2 was discontinued for want of time. Many other North Bay groups arrived at the missions in succeeding years, including the Tolenas, and the Canicaymo group of tribelets. Data regarding marriages among these groups and between they and earlier arrivals at the missions is provided in Table 3. This data is provided by the 1823 list of the married couples who returned north to found the Mission San Francisco de Solano at Sonoma. The list of these marriages is in the *Padron* of that mission on file at the Bancroft Library.

Although the data in Table 3 does not differentiate marriages contracted in pre-mission conditions from those taking place within the mission situation, it is assumed to accurately represent the pre-mission inter-group marriage pattern of those tribelets that do not appear in Table 2, that is, groups that were taken into the missions between 1818 and 1823. The data less accurately reflect the pre-mission relationship with these post-1817 arrivals at the missions and the earlier arrivals found on Tables 2 and 3.

Overlapping Group Names

It can be seen by comparing Tables 2 and 3 that many of the same group names appear at Solano as well as at the other missions. However, some groups which otherwise appear to be from the North Bay and which are baptized at San Francisco de Assis and San Jose do not

* Habasto came into the missions in 1800-1803, Huchiun-Aguasto in 1809-1810, Omiomi in 1811-1812 and Saclan in 1794-1795.

appear in the Mission San Francisco de Solano records. These include Alaguali, Omiomi, and Canicaymo, among the major groups baptized in the south. On the other hand, the Solano *Padron* lists many Huilucs, Canijolmanos and Caymus, as well as Tolenas as having been baptized at Mission San Francisco de Assis. This is far beyond the two or three members of these groups which are actually listed in the San Francisco de Assis batismal record.

Table 4 is the result of tracing neophytes of San Francisco de Assis listed in the San Francisco de Solano *Padron* back to the alphabetized *Padron* of San Francisco de Assis. This list indicates the practice, whether developed by the Indians or the Spanish priests, of lumping tribelets together under generic names. Other sources indicate that a group could be referenced by the chief's name, the land area name or the name of the most important village. In some cases where only a few individuals are baptized a subsidiary village may be indicated. In still other cases the same group may have different names originating from a bi-lingual situation, that is, a single village may be referred to but in two or more languages, resulting in some confusion of the record.

Generic Names: The Chocuyen and Canicaymo

The name "Chocuyen" in the records of the Mission San Francisco de Solano is applied to those listed as "Alaguali", "Chucuyen", "Geluasibe", "Olompali" and "Omiomi" at San Francisco de Assis and to "Alaguali" and "Choquiome" at Mission San Jose. In Table 1 the Chucuyen and Choquiome of the southern missions have been considered to be references to the same peoples on the basis of shared patterns of endogamy and exogamy. The practice of the mission recorders to combine groups of peoples must lead us to direct future research toward determining what linguistic and political implications such clustering evidences and what this clustering holds as clues to determining the geographical placement of these tribelets.

The "Canicaymo", baptized as a large group at Mission San Francisco de Assis in 1820, appear to be a composite group of "Huiluc", "Canijolmano", "Mayacma" and "Caymus"; the majority, by a margin of two to one, being Caymus. The generic term "Canicaymo" obviously applies to the Wappo-speaking tribelets at Mission San Francisco de Assis.

Land Tracts, Villages and Chiefs

Baptisms from #4986 through #4993 as Mission San Francisco de Assis are recorded as "*Chucuiens llamados tambien Sonomas*". On

Table 4: Individuals Listed on Both The San Francisco de Solano and San Francisco de Assis *Padrons*

SF de Solano Marriage Book			SF de Assis Register		
Baptism Name	Given Name	Tribelet	Baptism #	Given Name	Tribelet
Ambrosia	Uiuntole	Huiluc	6183	Uyumtole	Canicaymo
Albina		Napato			
Agapito	Polotilila	Chocuyen	4646	Polotilile	Geluasibe
Amiana		Napato	4972	Huyum	Napa
Amiano		Napato	4872	Huyumtole	Napa
Ambrosia		Napato			
Arcenio	Soluca	Malaca			
Arcerio		Chocuyen	4707?	Pera	Chocoay
Basilides	Cheche	Chocuyen	5252	Quechei	Olompalico
Camilo		Chocuyen	3602	Gecha	Omiomi
Catarine	Tupapi	Caymus	6156	Tupepi	Canicaymo
Cesario	Ayuc	Napato	1835?		Napa o Karkin
Carlos	*Uympel*	Malaca	5547	Huimpele	Malaca
Cornuto	Chicho	Huiluc	6156	Chicho	Canicaymo
Diego	Chouil				
Francisco	Uesu	Huiluc	6039	Uecsu	Canicaymo
Francisco de Assis	Ch'esa	Malaca	6016?		Ululato
Francisco de Sales		Huymen	3663		Costa
Felipe Benecio	Hosu	Karkin	4871?		
Gabriela	Numeya	Putto			
Genaro		Napato			
Emerenciana		Tolena	4475	Chaluchisma	Caguapatto
Estafania	Nauapanlpsi	Canijolmano	6122	Nauuiumitspi	Canicaymo
Gertrudis	Tepesaueypi	Caymus	6009	Tupetzaulpi	Canicaymo
Gregoria	Tole-ela	Caymus	6165	Toleela	Canicaymos

Table 4: Individuals Listed on Both The San Francisco de Solano and San Francisco de Assis *Padrons* (cont.)

SF de Solano Marriage Book			SF de Assis Register		
Baptism Name	Given Name	Tribelet	Baptism #	Given Name	Tribelet
Hermanigildo	Huechuise	Chocuyen	4246	Guecuecse	Omiomi
Hugolino	Heuta	Chocuai	5500	Heuta	Chocuay
Humeliana	Molocota	Zoneto	5381?	Suime	Suisun
Humiliano	Elipa	Zoneto			
Ysable	Tupechuya	Caymus	6172	Tupetxuia	Canicaymo
Juan	Ocsia	Huiluc	6064	Ocsia	Canicaymo
Joaquin	Chopacse	Chocuyen	5516	Ochopacse	Alaguali
Jacinto		Chocuyen	5427	Tototo	*Chcoayco*
Josefa	Mut.(?).cia	Malaca			
Leon	Upucsa	Chocuyen	5752		Chocoay
Macedonia	Pujelenucha	Chocuyen			
Maria Concepcion	Gueyamaen	Malaca	5986	Guelamain	Ululato
Maria de la Luz	Saquen	Huiluc	6047	Zaquen	Canicaymo
Maria Dolores	Yuela	Malaca	5964	Yualu	Ululato
Maria Dolores	Cataua	Caymos	6032	Cataua	Canicaymo
Maria Slaome	Muleyes	Malaca			
Micaela	Eyuslucmaen	Huiluc	6125	Guislussmaen	Canicaymo
Olimpia	Navayas	Tolena	4363	Nabaipe	Caguapatto
Pablo	Chalapaye	Canijolmano	6075	Chalalpuyel	Canicaymo
Pedro Pablo	Yulume	Malaca	5527	Yonomes	Malaca
Petra	Chalamispi	Alocyomi			
Petranilla	Ouoc	Canijolmano	6142	Oucc	Canicaymo
Rafael		Tolena	4518?	Jobochola	Suisun
Ramona	Amepi	Canijolmano	6140	Olmipi	Canicaymo
Salvador	Perec	Putto	5942	Xerech	Ululato

April 8, 1815, another group of Chucuyen were baptized. #5047 was a man of 60 years age named "Sonoma". This supports Barrett's (1908: 313) information that this was the name of a "captain". In his study Barrett states that Sonoma's real name was Tolopo. We are thus again confronted with the question of whether the term "Sonoma" signifies a chiefly title, the name of a chief's home village or something else again.

The group which in the records of Mission San Francisco de Assis is called "Caguapatto de lengua Napa" is seen from the Mission San Francisco de Solano records to be the same as the "Tolena" baptized at Mission San Jose. Once again, this may be a case of one term referring to the home territory of the group and another to the name of the main village or chief.

Barrett (1908:269) indicates that the village he recorded as "Annakōtanōma" (see Map 3) or "Bullsnake Village" may be the main village of the Canijolmano near St. Helena. Some of the smaller groups entered into the mission records, including the "Geluasibe", "Chocuay", "Puscuy" and "Choquinico" may be some of the more frequently recorded subsidiary villages of tribelets. It must be remembered that the political nature of the tribelets was in a dynamic state. Some small groups may have been undergoing a change in allegience from one central village to another, or a tribelet may have disintegrated leaving a number of small independent autonomous villages. All of the above mentioned small groups appear to have been related to the "Alaguali", "Petaluma" and "Olompali" and were centered around the mouth of Petaluma River.

Tolay Creek, named after an Indian captain according to Altimira in 1823, may be named after a "Chocuaco" man named "Tolay" (San Francisco de Assis baptism #5630) whose relatives were from Petaluma and his wife from "Puscuy".

Language Variation in Group Names

In some cases, the problem of "overlapping groups" may be resolved with the discovery that a single group is being referenced but in two different languages. This is definitely the case in dealing with peoples of the Pope Valley region. The "Aloquiome" of the Mission San Francisco de Solano records is comparable to Merriam's (1907) "Al-lok-ko-boo-je", meaning "Ear" village. Barrett (1908:269) places "Tse'manōma", from the Wappo word for "Ear Village", in the foothills on the east side of the Napa Valley about two miles northeast of St. Helena. This probably refers to the same village as the Miwok "Aloquiome". Evidence from female personal names indicates that it was a mixed language village.

"Alaguali" may be a Coast Miwok dialect term for "Eastern People" or "East World"; this may be identical with "Puscuy", "Pu" being a Patwin dialect term for "east".

"Central Sites" and Tribelet Location

The resolution of overlapping groups reduces the assortment of groups first encountered in a study of the mission records. The intermarriage patterns among the larger groups may then be analyzed for the presence of structured relationships. If it may be assumed that groups most regularly intermarried with their nearest neighbors these patterns should indicate the distribution of tribelet groups on the landscape.

Each tribelet group is, in some sense, an economic and political unit and both of these functions are promoted within the context of the group religious organization. Tribelet size will be maintained at a level large enough to support a full array of religious experts and dance groups, but will cover a small enough land base as to allow utilization of territory around the central site of recognized ideological importance.

The central site may be defined as the religious market area, with the cost of participation in religious affairs increasing with the distance travelled to the source. Thus, the patterns of these tribelets upon the landscape may follow the theoretical hexagonal model for economic market networks as described by Christaller (1933) and Losch (1954). As described by Losch (1954:112):

> The regular hexagon is the most advantageous shape for a market area just as it is for the true honeycomb, but for not quite the same reasons. With the true honeycomb the ratio of perimeter to area must be especially favorable; with the market, the ratio of cone to area. In both cases the circular form would be best were it not for the empty corners, The result of these is that in one case the wax, in the other the demand, is not utilized to the full. Among the possibilities of utilizing the corners, hexagon retains most of the advantages of the circle.

The theoretical implications for the North Bay are that each group will have borders with six other groups.

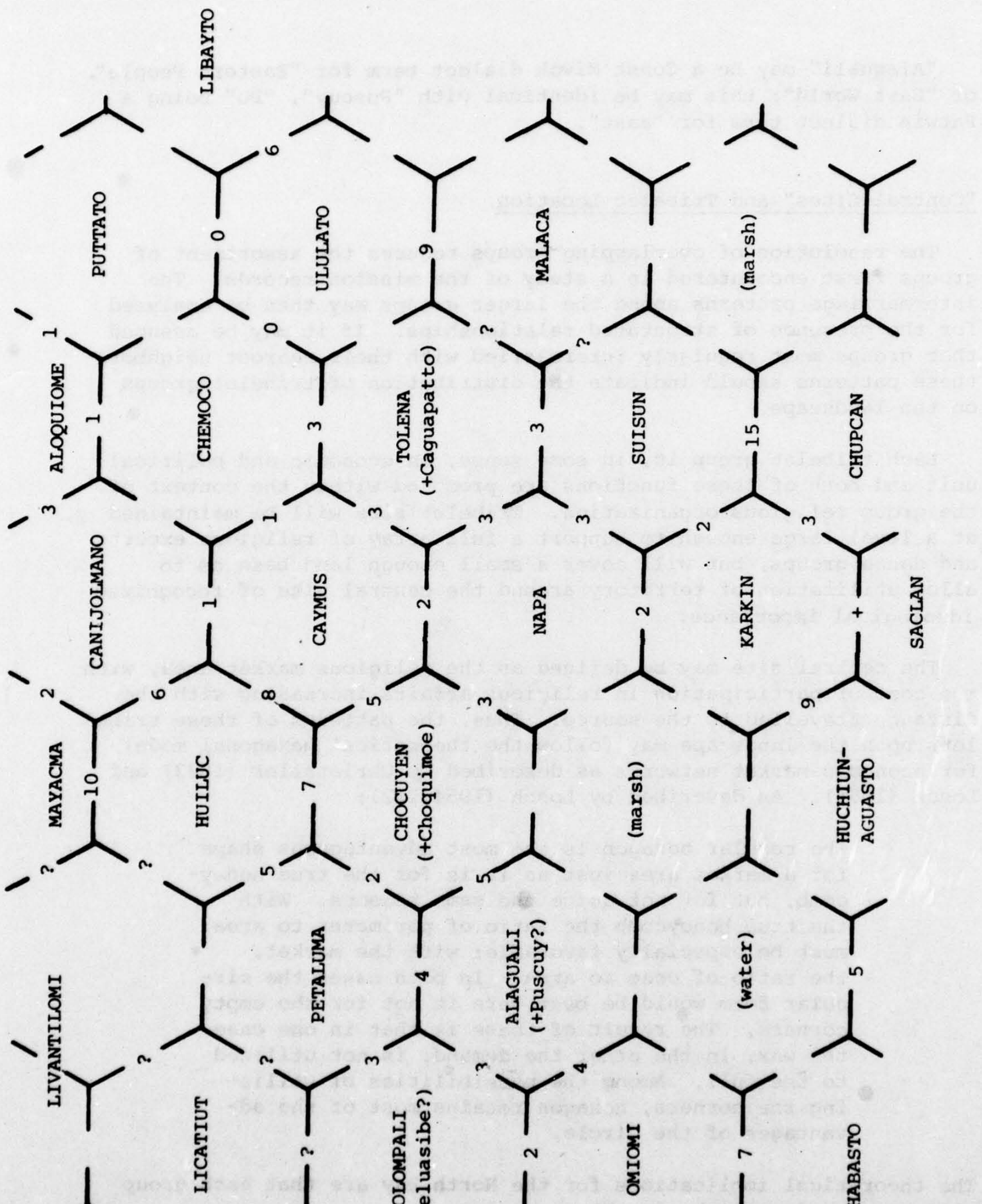
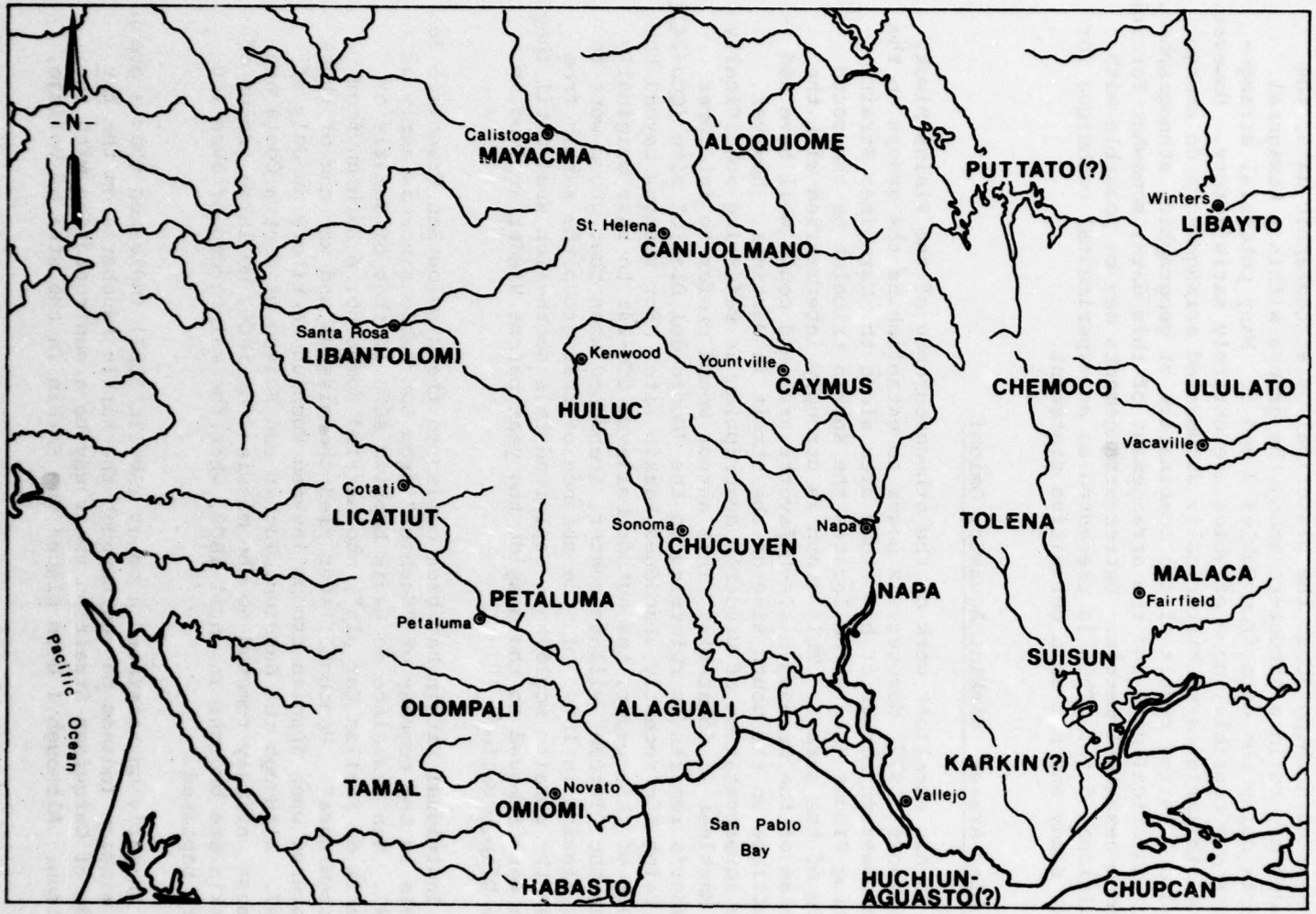


Figure 1 : One subjective arrangement of North Bay tribelets in "location matrix" connected by the relevant intermarriage figures from Tables 1 and 2 or from other mission record data.



Map 4: Placement of North Bay tribelets

Knowing nothing about the historical or ethnographic data, the reader may build a structure among the groups within a hexagonal matrix using the data from Tables 2 and 3. Many potential arrangements are possible, none of which are entirely satisfactory. However, some similarities to historically documented arrangements do emerge. Figure 1 is the result of the combination of geographic, ethnographic, and historical data and the arrangement of this data, somewhat forcibly, into a hexagonal matrix. Better arrangements may be possible with additional data. This is presented as an experimental technique for this study and not as a definitive statement.

Problem Areas: Karkin, Aguasto, Omiomi

In his excellent work on the ethnogeography of the Plains Miwok, Bennyhoff (1977) devotes six pages to establishing the groups on the southwestern border of his study area along the Carquinez Strait. Citing Viader (n.d.), he locates the Karkin tribelet on the south side of the strait. This group is strongly intermarried with the Saclan of the Briones Hills-Lafayette area and could well have had a village on the south side of the strait in Martinez. However, his interpretation of Viader's description as referring specifically to Martinez is debatable. This author would prefer to interpret Viader's remarks as referring to the "Monte del Diablo" site (CCo-241) as being the recently abandoned Karkin site. For reasons beyond the scope of this paper, the author believes CCo-241 to have originally been the "Tatcan" village center, abandoned when that group went to the mission in 1804. In the absence of that group the Karkin from near the straits would have exploited this acorn-rich area until they too were removed to the mission the year before Viader arrived in the Diablo Valley.

Individual Karkin had been coming to the Mission San Francisco de Assis in the company of "Huchiun" from San Pablo since as early as 1787. San Francisco de Assis baptism #658 is that of Nazaria of "Turis de Familia Carquin", who married Homobono, a Huchiun from "Josquizara". Homobono later fled the mission and was one of those captured when Spanish troops invaded Huchiun territory in July of 1797. Although the Huchiun, Tatcan and Volvon of Contra Costa are almost entirely removed to the missions by 1806, no large groups of Karkin are brought in until 1809, when the main group of over 100 were baptized.

An early untranslated account (Abella 1807) indicates that a group of mission Indians passed through the Karkin rancheria on the far side of Carquinez Strait on their way to a confrontation with the Suisun. Although I have placed the Karkin in the area of Vallejo,

a placement more consistent with the hexagonal matrix would locate their main village at Benecia, possibly at the site of the old state capitol.

A group whose name is spelled variously in the mission records as "Habasto" and "Aguasto" came to Mission San Francisco de Assis in 1800-1803. These people were heavily intermarried with Huimen, Gualen, Olema and Tamal of Marin County, with the Huchiun of San Pablo and with the Omiomi, who will be discussed below. Bennyhoff (1977) combines this group with the Huchiun-Aguasto and places them in Vallejo. I believe that they should be placed at San Rafael and that the site of Mission San Rafael, "Nanaguani" (San Rafael *Libro de Bautismos*, title page), was one of their villages. The Huimen, assigned by Bennyhoff (1977) to San Rafael, inhabited the villages of "Livenglua", "Anamas" and "Naigue", all found in the mission records before 1800, and all located by Merriam (1968) on Richardson Bay.

Blandina (San Francisco de Assis baptism #708) from "*familia Aguasajuchium de la Rancheria e Ssogorate en el Puerto de la Assunta cerca del desemboque del rio grande de San Francisco*", came to Mission San Francisco de Assis to marry Bonifacio of Genau (Huchiun?) in 1788. Bennyhoff (1977:141-142) interprets early maps to indicate this *Puerto de la Assunta* to be Southampton Bay near Benicia. For this reason he assigns the north shore of the Carquinez Strait to the Aguasto. Larger groups of Huchiun-Aguastos do not appear in the mission registers until 1805, at which time they arrive in the company of Huchiuns. Later, in 1809, more of these people arrive and they are heavily intermarried with Karkin.

This seemingly clear distinction between the Habasto ("Aguasto") and the Huchiun-Aguasto in the baptismal records is clouded by reference in the *Padron* of 1822 for Mission San Francisco de Assis to many persons who might otherwise have been thought, from the record of the *Libro de Bautismos*, to be Habasto, as Huchiun-Aguasto! This confusion may only be eliminated by careful reconstruction of the kinship ties of the individuals involved and by careful cross-checking between the *Padron* and other record books of the mission.

For those individuals who may clearly be assigned as Habasto or Huchiun-Aguasto, there is a clear differentiation in the pattern of female personal name suffixes. Habasto have typical Coast Miwok names, while the personal names of the Huchiun-Aguasto are more often akin to Huchiun and Karkin, but most often akin to Napa and Suisun.

Bennyhoff (1977) places "Omiomi" along the lower Napa River. If such were the case we should expect to find strong marriage ties between the Omiomi and the Napa, Karkin, Suisun and Chocuyen. However,

the Omiomi are found to be strongly intermarried with the Tamal, Costa (Tomales Bay area) and Habsto groups. They are weakly tied with Olompali. It may be, however, that the "Geluasibe", with whom they are also strongly intermarried, is an early alternate name for Olompali.

The 1807 letter by Abella regarding the incidents between the Suisun and the Mission Indians contains a footnote that lends support to Bennyhoff's interpretation of the placement of the Omiomi. Referring to the Carquinez Strait area, Abella says that there were other rancherias called "Omiomi", where sixty-two runaways were hidden. I do not feel that this reference may be taken as reliable, but feel other evidence places the Omiomi in the Novato area. It is doubtful that Fr. Abella was fully cognizant of North Bay geography in 1807 and may have been in error.

The first two Omiomi people were baptized at Mission San Francisco de Assis on December 5, 1802, along with a large group of Tamal. They were said to be from "north of the Aguastos". Two months later another group of Omiomi came to the mission, again in the company of Tamal people. Among them was a 30 year-old man who was baptized "Novato". This man is the only man listed in the first book of baptisms at San Francisco de Assis with the name Novato and may have given his name to the present Marin County city of that name.

Discussion

The previous discussion has sought to integrate the findings of early ethnographers and later researchers with the data contained in the mission records. At best, we can now assign a general location of tribelet groups in the North Bay. The resulting Map 4 is the most easily defended placement of tribelet groups existing at the time of Spanish settlement. These data do not serve to define the precise territory of any group.

The correspondence of Yount's "nations" with aboriginal tribelets is indicated. The presence of two or more tribelets in the lower Napa Valley ("Napa" and "Uluca" of Yount) is not indicated at the time of initial European contact. Nap-261 appears to have been located in the border area between the Napa and Caymus. There is some evidence to suggest that the western territory of the Tolena ("Caguapatto") extended down Tulucay Creek or Sarcos Creek to the Napa River. Whether this extension was an area under their control in pre-contact times or was a condition afforded them after the arrival of Euro-American settlers is not clear, however, it may account for the "extra" tribelet recalled by Yount.

The fact that such tribelet names as Suscol, Tulucay and Tchiminukme never appear in the mission records does not discount the possibility that they were extant places but were designated by other terms. Nor can the possibility be precluded that they, or at least Suscol, may have been villages founded after the secularization of the missions.

North Bay Languages

Language Groups

The first attempts to classify the native languages of San Francisco Bay Area peoples were made by L. Choris and A. Chamisso in 1816. They were members of the Kotzebue Expedition, circling the world under the imperial Russian flag for purposes of scientific investigation. Excerpts from Choris' journal (Mahr 1932:365) follow:

> It is reckoned that there are more than fifteen Indian tribes represented in the mission. ...
>
> The Guimen — The Tamals
> The Uchiuns — The Sonomas
> The Olompalis,
>
> likewise speak one language. These tribes are the most largely represented at the Mission of San Francisco.
>
> The Saklans — The Ululatines
> The Suisuns, — The Numpolis
>
> speak different languages.

Neither Choris nor Chamisso left vocabularies. The next person to pay attention to the local languages, Father Arroyo de la Cuesta of Mission San Juan Bautista, did record short vocabularies of Bay Area tribelets. These word lists were taken in 1820 at Mission San Francisco de Assis. Their content has been reviewed by Beeler (1955: 202) as follows:

> All of these languages were apparently spoken in the area of San Pablo Bay, the straits, and Suisun Bay to the east. They are, in Arroyo's orthography, Huimen (=southern Coast Miwok of Marin County), Juichun (=East Bay Costanoan, in a form not very different from the hitherto known dialects of that region, those of San Lorenzo and Mission San Jose; a tentative location is north of Richmond near the present town of San Pablo), Karkin (=apparently near the straits of

that name; this is a divergent form of northern Costanoan, and its discovery confirms Kroeber's guess on the character of the speech of that area); Suisun (=southern Wintun, on the northern shores of the bay of that name), and Saclan.

With the exception of the case of the "Juichun" ("Uchiuns" of Choris and "Huchiun" of mission records) the Arroyo vocabularies complement and clarify the groups of Choris. These Huchiun of the Richmond area are fronted on the east by Miwok-speaking groups. It may be they were a bi-lingual group.

Eugene Duflot de Mofras visited the missions in 1841. He recorded the Lord's Prayer in the "Guiluco" language of Mission San Francisco de Solano. It substantiates the theory that the Huilucs spoke a Wappo language. He also recorded elements of two Miwok languages, "Joukiousme" of San Rafael and "Chocuyen", "of the River Sacramento". In terms of understanding the origin of the term "Hookooeko" as applied by later authors to the eastern Coast Miwok people, it would be important to know if this term refers to San Francisco de Solano Chocuyen (alias Sonoma, Alaguali, Olompali) or to the Miwok-speaking Chucumne of Cache Slough near the Sacramento River. Resolution of this problem is not within the scope of this study however.

Powers (1877) published Gibbs' vocabulary of the "Tcho-ko-yem", "obtained from Indians living at the head of Sonoma Valley, California". Once again, this is a Miwok word list. All of the early evidence suggests that the area west of the Napa Valley was occupied by Miwok-speaking tribelets, while Patwin-speaking informants, however, reported to ethnographers that it was their language which was spoken in that area. However, it must be considered that both sources of information are from post-mission times.

Although there are no language lists for the Napa tribelet, there is no evidence to contradict Merriam's informants that it was "Win" (Patwin).

Dialect Identification from Female Personal Names

Bennyhoff (1977:40) used female personal names from the mission records to establish the lingustic affinities of Central California Delta tribelets. He noted the repeated occurrence of certain suffix constellations among linguistically related groups. Sample pools of 50 female names have been taken from most of the North Bay groups. Table 5 provides a sample of representative female names for twelve groups. Careful study will reveal the repetition of many root and suffix sylables, which tend to differentiate the major language groups,

Table 5: Representative Female Personal Names of North Bay Groups

WAPPO	MIWOK	MIWOK	POMO	PATWIN	COSTANOAN
Mayacma	Olompali	Chucuyen	Gualomi	Libayto	Karkin
Casejolpi	Ellapo	Gualamayen	Acaimen	Tichomayen	Caquastole
Catauapi	(G)uenumayen	Geyumtole	Atoam	Chouijeyum	Geyumaien
Chalachampi	(G)uenumtole	Gucumpo	Balicamen	Chouilquel	Gualamaen
Chalautise	(H)uyumayen	(G)uenumayen	Batacachomen	(G)eyumal-la	Guec uek
(G)eyummayen	Jobocela	(H)uyumaye	Cucnatamamen	(G)eyumquel	Guecupame
Juyumichipi	Joboctole	(H)uyumtole	Cuttacamen	Jeyumual-la	Huyumaien
Leluecpi	Ozacamayen	Jobocguala	Guilagumen	(G)ual-la	(H)uiusmaie
Tupejuppi	Ouoc-ela	Lelupi	(H)uyuccumen	(H)uyumticho	Pispiste
Tupulaleli	Pispistole	Ouocsaquen	Ychochomen	Ossatemayen	Saquenaie
Tupulapujel	Unisquen	Pispistole	Libalacoyomen	Sotipom	Seamaen
Tzalajilupi	Zaquenmayen	Saquenpi	Matucamen	Tichomayen	Toleate
Tzalaolpi	Zaquenpo	Toleaye	Tutumen	Tonayquel	Toleme

			PATWIN		
Canijolmano	Omiomi	Alaguali	Napa	Suisun	Souyen*
Alipi	Chaguilmaen	Auyumaye	Aocmaye	Choguilmaie	Caunate
Chalanampi	Elamaen	Elamayen	Chalapi	Geyumaen	Cauttum
Chalautise	Guenumjeyum	(G)eyumaye	Cholemayen	Geyumtole	Cullnem
Yuquimayen	Guenumaie	(G)uenum	(G)eyumaye	Gualajaye	Huilum
Lelucpi	Huyumaen	Huyumaye	(H)uyumayen	Gualame	Yamurum
Saquenmepi	Tolejoboc	Ou-oc-saquen	Jobocsaquin	Guenumaie	Junissmaye
Tolemayen	Pispiscela	Pisspiss	Ossumpo	Huiumain	Massepate
Tupeaupi	Ochacamote	Pisspitole	Ouoctole	Ysibala	Rurtam
Tupulajauapi	Sacuempo	Tole-ela	Tupula	Ysiquel	Sacnem
Tzalaampi	Saquentole	Zaquen	Unimayen	Nomeyu	Ssaohate
Tzalassampi	Saquenuyu	Zequilpo	Zaquentole	Siamaen	Ssucuntu
Uculpi	Tolenupo	Zuyuppi	Zaquenilapi	Tichobala	Sucume

* Costanoan-speaking people of the Livermore Valley

with the exception of the Patwin and Coast Miwok.

The suffix "-pi" occurs in 80% of the Mayacma female personal names. This percentage drops to 60% among the Canijolmano and the Chemoco*. We should not automatically assume, however, that these groups spoke only the Wappo language. Bennyhoff (1977:41) indicates that name types may drift across language boundaries. Although "-pi" very likely represents a Wappo form, the Canijolmano and the Chemoco may well have been mixed language groups, as were the "Loaquiome" ("Loknoma") of Middletown and the "Aloquiome" ("Tsenoma") of Pope Valley. The suffix "-pi" also occurs in 20% of the Tolena female personal names and 8% of the Napa names.

The suffix "-mayen" also occurs in Wappo groups, but at a rate of less than 10%. Together with the possible variant form "-maye", it is the most common suffix among Miwok and Patwin groups. Kroeber (1932) was informed by the Colusa Patwin that the term refers to women's secret society members. Gifford (1916) reports that it is the designation for women chiefs in the Sierra foothills. Dietz (1976:8) indicates that the Coast Miwok also used the term for women chiefs. Although the suffix is also included in Harrington's (1921) Chochenyo word list for the people of the San Leandro area, it may be that his informant was of mixed parentage, partly from the North Bay. Karkin and Huchiun, fixed as Costanoan by Arroyo, have the heaviest concentration of "-mayen", around 30%. This term is entirely absent from the Coastanoan groups from San Francisco and the Livermore Valley to the south. As indicated by the Souyen list (Table 5), 'vowel+m' is the common Costanoan suffix. "-Mayen" is such a common suffix throughout the North Bay that it cannot be used to differentiate dialect groups in that area.

The suffix "-men" occurs in 80% of Gualomi female personal names (Santa Rosa area) and in equal frequency in names of the closely intermarried Yaujome. The latter is the only group that could be synonymous with the Yajome Rancho to the immediate north of Nap-261. Yet, this group does not intermarry with known Napa Valley groups, nor is the "-men" suffix, associated with the Pomo language, found among any of these Napa Valley groups.

The suffix "-po" is found in the personal names of 14% of the women of the Gualen, Habasto, Olompali, and Omiomi Coast Miwok groups. This suffix is not found among the Pomo, Wappo or Costanoan-speaking tribelets. The "-po" suffix occurs only once among the Napa women and never in the assumed-to-be Patwin groups to the east. The situation among the Petaluma, Alaguali and Chucuyen (Sonoma) seems to be intermediate between the centrally located Coast Miwok-speakers

* Caymus has not been sampled; most are within the Canicaymo group which has not been broken down into tribelets.

(with 14% of names with the suffix) and the surrounding non-Miwok neighbors that do not have the suffix. Petaluma, Alaguali and Chocuyen female personal names evidence the "-po" suffix in 5% of recorded names.

Female personal names seem to clearly indicate the extent of the Wappo and Pomo language groups and to reinforce the hypothesis that the Napa-Caymus or Napa-Caymus-Tolena border area was also a language boundary. However, no such clear-cut boundary may be discerned among the Penutian groups, especially between the Patwin and the Coast Miwok. The Karkin may be differentiated based upon the common "-me" and "-te" suffixes which they also share with the Diablo area Miwok (Julpun, Saclan, Tatcan and Volvon) and other far-northern Costanoans (Yrgin, Huchiun and Saoam).

Previous researchers have indicated that the Napa tribelet peoples were Patwin-speakers. The analysis of marriage patterns and the study of female personal names would indicate a close relationship between Patwin and Coast Miwok groups and reinforces the assumption that there is no necessary correlation between linguistic affinity and the socio-political structure of cultures.

The Napa Tribelet

Marriage Networks

Much work has been devoted in recent years to the study of the social structure of California tribelets. The powerful families of each group intermarried with equally powerful families of neighboring groups. This facilitated alliances for communal hunting efforts, trade relations and the co-ordination of groups in the production of yearly ceremonial events, often called "Big Times".

Aginsky and Aginsky (1971) brings together knowledge gathered from various ethnological sources to provide a fictionalized account of the Big Time of the Ukiah Valley people. The event required complex arrangements between families to assure the presence of appropriate ritual performers and to provide the food necessary for hundreds of people over a four day period. The group described by the Aginskys held the Big Time once every seven years. Such a pattern may have some relation to the hexagonal structuring offered by location theory.

If such a ceremonial pattern were followed by the Napa tribelet, they would have direct access for trade and intermarriage with their immediate neighbors as well as with groups once removed, from the Petaluma Valley to Vacaville, from Mt. St. Helena to the Diablo Valley.

This would include at least 15 groups, speaking Coast, Lake and Diablo Miwok, Pomo, Wappo and Patwin dialects.

Seventy-nine marriages have been recorded between the Napa and other tribelets. Forty-one of these marriages were endogamous. Twenty-six were marriages taking place sometime after the people went to the missions. Ten took place at the time the Napan's spouse's group was being baptized: two each were with Chocuyen, Karkin, Huchiun-Aguasto and Suisun; one with Tolena and one with Alaguali. Five of these were women and five were men. Only two people married to Napas when the Napa peoples were baptized were indicated as being from other groups; a man and a woman, both Tolena people. There is no controlled data for groups to the north since Canicaymo marriages have not been analyzed. This information parallels that of Gifford (1916) indicating both male and female exogamy.

The question remains as to why the mission records reflect so few numbers of people from other groups living among the Napa tribelet. Several suggestions may be offered in this regard:

1. Some people from other villages or tribelets may not have announced the fact to the Spanish priests;

2. Analysis of the marriage lists needs greater control;

3. There may have been special circumstances created by the patterns of group reaction to the mission situation.

Of the twelve cross-group marriages recorded, probably half resided with the Napa tribelet in pre-mission times. Another four marriages among the Napa may have involved northern groups not included in this study. Of 100 married individuals of the Napa tribelet at least ten would probably identify themselves with neighboring groups.

While this brief analysis of marriage networks is admittedly weak, owing in part to the enormous amount of time which would otherwise be required to complete a thorough study, it is included as a suggestion of the further array of data available in the mission records.

Class Structure

Bean (1974:22) has suggested that California groups had strong class structures and the upper-class families formed interlocking networks across tribelet boundaries. Unpublished research by Gibson (1975) and C. King (1974) dealing with the mission records indicates that this was actually the case in areas around the San Antonio, San Juan Bautista and Soledad missions.

Powerful families may often be recognized by indications that a single male has two or more wives, although only one marriage is given sanction by the Catholic Church. Although there are many examples of half-siblings among the Napa baptisms, the genealogies have heretofore not been sufficiently defined to prove that any individual male had more than one wife at the same time.

In some cases the mission records identify the "captain" of a given group, for example, Lichi of the Huchiun, Telemela of Olompali or Sonoma of the Chucuyen. None of the Napa, however, are designated as captain. This does not necessarily mean that the Napa captian was not baptized. In many cases the captain is identified indirectly, sometimes in the record of the baptism of one of his children. There are probably cases, and this may be one of them, in which the captain is not distinguished at all.

Information exists in the mission records to reconstruct the entire web of genealogical relations in the North Bay and in so doing clarify the relationships which existed between important tribelet families. Such a formidable task would require the computerization of mission records for all of the North Bay tribelets. An effort well beyond the scope of this study.

Cultural Boundaries

The only area in which linguistic boundaries appear to correspond with interruptions in marriage networks is along the Pomo boundaries of the Santa Rosa plain. The network in this area must be further explored in the records of the Mission San Rafael.

A look at the female names on Table 5 will reveal a large group of popular root elements such as "Pispis" (a shell bead), "(G)uenum", "(G)eyum", "Huyum", "Tole", and "Joboc" among the Penutian groups. These name elements occur south in Marin and Contra Costa Counties to an east-west line bisecting the Golden Gate. Similar repetitive root elements occur among the Plains Miwok. South of these areas, in the Coast Ranges and the Central Valley, an entirely different pattern emerges in female names. Root forms seldom appear twice in the same group, and few are duplicated even over a wide area.

Although the roots are different, the pattern of repetition of popular forms continues among the Wappo-speakers. The dramatic shift in patterns seems to be indicative of a different attitude toward names. The often repeated theory that names could not be inherited or duplicated because the name of the dead should not be spoken seems to hold for the south-central Yokuts and Costanoan peoples. However, this can not be the case among groups in the Carquinez Strait area

or to the north among the Miwok, Patwin, Costanoan and Wappo groups.

Other shifts in culture elements have been noted for the Central California region. The strong dichotomous moiety system of the south seems to weaken in this region. Also, the largest yearly ceremony to the south and in the San Joaquin Valley was the mourning ceremony; among the north Central California groups it seems that such a ceremony was held within the tribelet at a time other than that of the inter-tribelet Big Time.

If personal names are any indication, it may be that the Napa tribelet, or whatever group resided in the Las Trancas vicinity, was participating in a cultural network that ignored language bounds, at least at the time of initial European contact.

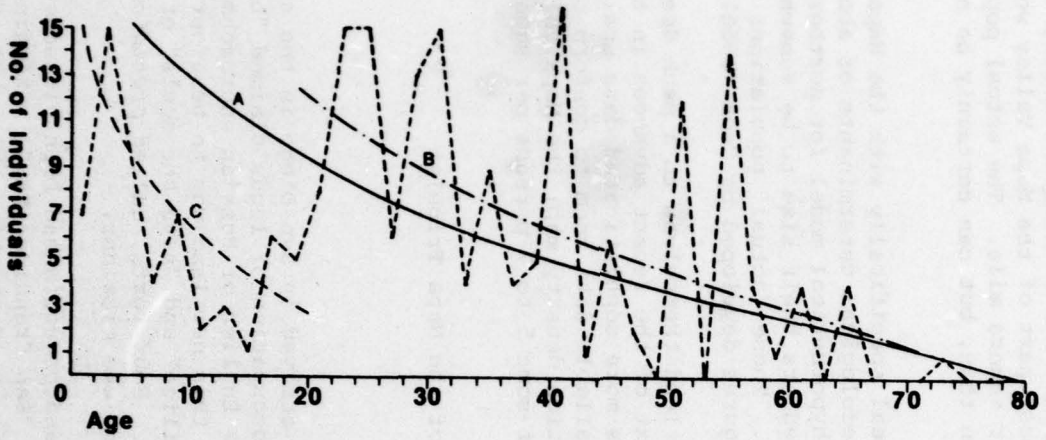
Demography

Figure 2 shows the age-class structure of the Napa group at the time of baptism at Mission San Francisco de Assis and Mission San Jose. These are the ages as reported by the priests, however, and do not necessarily represent the actual ages of individuals. The sharp peaks and valleys of the figure are a reflection of the approximation of the priests' estimates; ages such as 40 or 50 were more likely to have been assigned than 43 or 51.

The female and male curves do not vary greatly and are therefore not depicted graphically. A continuous curve 'A' assumes that the mission Fathers had no grasp of the actual age of pre-adolescents of adolescents. Size differences among people at this age should make them more easily categorized.

The alternative reading of the graph is to see a bifurcated life curve 'B' and 'C', with a severe depression in the under-20 year old population. Explanation for such a bifurcation, if in fact it did exist, involves the onset of some sort of disease at a period twenty years prior to the missionization year of 1815-1816. Perhaps the introduction of new strains of respiratory disease cut down the survival rate of new-born infants by half. Alternatively, the female fertility rate may have suddenly dropped; this is less likely. The effects of disease or nutritional changes on female fertility should not be so sudden.

Accepting the assumption that the under-20 population is half that during pre-contact times, we may add another 60 persons in computing the size of the "normal" group. We may also assume that many adults had died of disease prior to missionization and add another 40 persons. A total natural population of 310 individuals for the Napa groups is



Male:	4	6	5	3	4	2	1	0	2	3	3	5	8	2	5	8	3	4	1	3	8	0	5	0	0	6	0	5	1	1	1	0	1	- [100]
Female:	3	8	5	1	3	0	2	1	4	2	5	10	7	4	8	7	1	5	3	2	8	1	1	2	0	6	0	9	3	0	3	0	3	- [117]
																																		[217]*

*This discrepancy with the two hundred-twelve reported Napa baptisms is due to the accidental inclusion of five individuals from other rancherias with the Napa group

Figure 2: Age structure of Napa tribelet at baptism in 1815-16

a conservative estimate.

Cook (1956) relies largely on Yount's estimates of the Indian population on Spanish ranchos in 1843 to conclude that the pre-contact population of the Napa Valley was approximately 4500 or 7.5 persons per square mile (approximate total area being some 600 square miles). If the diameter of the Napa tribelet territory were approximately 10 miles and the land base about 85 square miles, the conservative estimate for this richest part of the Napa Valley would come to approximately 4 persons per square mile. The actual population figure is no doubt higher than this, but can certainly be no more than Cook's estimate.

Baumhoff (1963) does not deal specifically with the Napa Valley tribelets in his analysis of ecological determinants of aboriginal California populations. His hypothetical model for northern Wappo and Lake Miwok populations predicts their size to be somewhat lower than the "actual" populations. These "actual" populations are no more than the hypothetical figures developed by Cook (1956).

The mission records should lend themselves to a much deeper demographic analysis in the context of the recent advances in the state of that science. Lacking this more sophisticated data analysis, suffice it to say that the available data seem to conform to Baumhoff's (1963:223) generalized population density map; the Napa Valley probably supported a population of some 5 to 7 persons per square mile.

Destruction of the Napa Tribelet

The Spanish Invasion

A small group of Spaniards arrived in San Diego in the summer of 1769. Their purpose was the occupation of lands claimed "by right of discovery" against possible English or Russian encroachment. The backbone of the settlement of this new land was to be a series of missions, established to "civilize" and "save the souls" of the aboriginal California peoples. Four forts, called *presidios*, were build along the cost to protect the missions.

The northern-most mission and *presidio* had been planned for Drakes Bay, called by Spanish seamen "San Francisco Bay". Skirting the present San Francisco Bay in hopes of reaching this goal, the exploring parties of Fages (in 1772) and Anza (in 1776) were halted by the Carquinez Strait. Thus, the Napa area was temporarily guarded from European encroachment. The present *presidio* and Mission Dolores (then Mission San Francisco de Assis) in the city of San Francisco

were to be the northern anchors of the mission system from 1776 to 1817.

Missionization of the Indians

Until 1794 the missionization efforts of San Francisco de Assis were directed at the San Francisco Peninsula. In the fall and winter of that year the population of the mission rancheria more than doubled from around 400 to 850 people. Large numbers of Saclan and Huchiun from the East Bay arrived as a group. By late winter the death toll had also more than doubled. Two hundred had died by the end of spring. Those of the newcomers who were able (more than 200) fled the mission sometime in late April of 1795.

Father Danti sent 14 people, most of them Huchiuns who had been at the mission for a number of years, to convince the runaways to return. Journeying to the Saclan rancheria (probably at modern Lafayette) they found that the people had left. They travelled from noon until two o'clock the next afternoon to reach the rancheria of the Chimenes. Here they found the Saclan, "together with a number as great as that at the mission". The emissaries were attacked and seven were killed. Othon, one of the survivors, stated that the Chimenes lived toward the Port of Bodega (Cook 1957).

Who were the Chimenes? The single reference by Barrett (1908:293) to "Tcīme'nukme" at Napa City comes to mind. From Lafayette, Napa is in the direction of Bodega, which was probably one of the few landmarks north of San Francisco known to the priests and soldiers in 1795. Travelling on foot and stopping only to bundle some tule rafts, it would take approximately twenty-four hours to reach Napa from Lafayette.

We must question, here, whether the Saclan had fled across the straits to the Karkin villages, with whom they were already strongly intermarried. This is the year (1795) that demographic data suggest the Napa tribelet reproductive rate declined drastically; we might surmise that the epidemic raging at the Indian rancheria at San Francisco de Assis may have been spread to the Napa tribelet - twenty years before they ever entered the mission.

The Saclan were surprised and defeated by a Spanish military force in their home village on the morning of July 18, 1797. At the same time the new mission of San Jose was being founded in the present day Fremont vicinity. By 1806 almost all of the people south of Carquinez Strait and west of Mount Diablo had come into one or another of the missions. Resistance by remnant Saclan and allied Volvon under the leadership of Joscole and others prompted a series of military

expeditions up to 1805 (Cook 1957).

In January of 1807 three couples fled the Mission San Francisco de Assis upon the death of one couple's child. Octavio, one of the runaways, returned on Tuesday, February 3rd, to explain that his wife had been taken away from him and to request assistance from his family to get her back. The priests sent 130 unarmed men to settle the problem. They reached the "*estrecho de los Karquines*" on Friday afternoon and crossed to the other side. Here they split into two groups, 70 proceeded toward a nearby rancheria of the Karquines and 40 continued inland. This latter group was harassed along the way and the situation became intense. As they approached the village of the "Suis Suin" gathered people, armed and waiting, began chanting "Hoorahs". Some of the youngest of the mission group turned and ran, starting what became a footrace to the "*embarcadero de los Karkines*". There, nine of the mission group were killed with cudgels and arrows. The remainder escaped back to the mission (Abella 1807).

Father Abella states that of those killed, seven were from the San Francisco Peninsula or those who had learned that language. One of those killed, Juan de Los Santos, had been the captain of the rancheria "Oljone" from San Gregorio or Pescadero in modern San Mateo County (San Francisco de Assis *Difuntos* 1797). Abella says that the mission party was, "of divided heart, and that the majority took the part of the gentiles and wild runaways." Abella called upon the Spanish governor to send troops across the "estuary" to punish the Suisun.

For the next two years all baptisms at San Francisco de Assis are of peoples from Marin County. In 1809 large numbers of Karkin, Chupcan and Huchiun-Aguasto came in from the Straits area. Among them was a 24 year-old Napa woman named "Saquempame" (San Francisco de Assis baptism #3656). Her 30 year-old husband (baptism #3655) and two month-old child (baptism #3641) were listed as Huchiun-Aguasto. Another Napa woman, Tolepu (baptism #3856), came in with her Karkin husband.

On May 22, 1810, Father Abella's wish for an attack on the Suisun was fulfilled. Gabriel Moraga headed the attack on the village of "Sespesuya", fighting 120 "pagans" and burning the house of the last resisters when they refused to surrender (Bancroft 1885). Suisun people began to be baptized in fairly large numbers soon after the battle, as indicated in Table 1. Among the first was Francisco Solano (San Francisco de Assis baptism #4024), the later ally of M. G. Vallejo.

With the protective wall of the Carquinez Strait finally penetrated, many runaways now returned to the mission. Guilacsia (San Francisco de Assis baptism #2829), a Huchiun-Aguasto, had been baptized in 1803

with his wife Guepumaen (#2839). He seems to have been living in Napa since at least 1807, since his four year-old and two year-old sons were baptized in April of 1811 with their Napa mother Choguilmaen (#4262).

Spanish Presence in the North Bay

Many previously undocumented Spanish visits to the North Bay prior to 1820 are recorded in the San Francisco de Assis *Libro de Bautismos*. Father Abella of Assis visited Alaguali and perhaps other settlements in the summer of 1811, two months before his expedition to the Delta (the latter has been published by Cook 1960). The notation accompanying baptism numbers 4414 and 4415 follows:

4414 Bernardo *Dia 21 de Agosto de 1811 en la Rancheria llamada Cholequebit bautice Primeramiente a un Varon como de 60 anos, llamado Guequeque, alias Telgua, le puse por nombre Bernardo, es* (illegible) *-miente enfermo.*

4415 Bernarda *Y a una muger como de la misma Edad, llamada Motus, le puse por nombre Bernarda, es de la misma Rancheria, le llaman los Aguastos a aquilla tierra, Alaguali, dista de la Mission por aqua, como unos 16 o 18 leguas.*

Llegamos a dthro Rancheria, el dia de (illegible) *Bernardo, con dos Lanchas, la una de immediado Presidio, y la otra de la Mission, de R. P. Fr. Buenaventura de la mission de San Jose, el Cadete Dn. Gervasio Arguello, el Sargto. Joseph Anto. Sanchez, una cabo y ocho soldatoes; esta al norte, a casi Norueste de la mission, Ay buen Desembarcadero. La muger era decrepitos; y lo firme.*

Ramon Abella

Abella returns in 1812, this time to visit the Napa rancheria itself (San Francisco de Assis baptism #4541):

4541 Ramona de Napa *Dia 12 de Marzo de 1812, Junto el Estero de la Rancheria de Napa, bautise privadamente a una Nina como de seis meses de Edad, la que a mi parecer y de sus Padres se hallava gravemento enferma, le puse por nombre Ramona, hija de Padres Gentiles; llamados Telpatole y Guenmute, los que voluntieramente .. la ofrecieron de su plieyum los ceremonias y pusieron*

los SSantos oleas uno de los RRPP (?) sin tres de las mission de Sn. Josef en donde se alla (this last part added later - RM).

Ramon Abella

In the meanwhile, two more Napa men had come to the mission. They were Copii (baptism #4419) and Lilic (baptism #4494). Their wives and children are Suisun.

Fort Ross was founded by the Russians in 1812. Gabriel Moraga visited the fort in August of that year and again every year through 1815 (Bancroft 1885). During this time the structure of life for the North Bay aboriginal populations, already crippled by the decline in the number of children, appears to have crumbled. At first, small groups from Napa and Tolena (Caguapatto) came to the Mission San Francisco de Assis. In 1814 Mission San Jose began to receive Napa and Petaluma people in larger groups than San Francisco de Assis. Table 1 indicates that this splitting of the groups Napa, Chocuyen ("Choquiome" at San Jose), Alaguali, Petaluma and Olompali continued through 1816. All of the Suisun, however, went to Mission San Francisco de Assis. Two factors may be considered regarding the Suisun, however: the *presidio* was located at San Francisco and the Spanish may have wanted the Suisun under the close scrutiny of the military; it may also be that families of the other groups may have been ordered to San Francisco as hostages to prevent trouble.

The Napa village or villages were abandoned by the spring of 1815. Although only a few intermarriages have been found, the Napans were consistently baptized in groups with Chucuyens. Caüasu, one of chief Sonoma;s sons, was married to Uymute of Napa and seems to have lived there. The Napa and Chucuyen baptized the following year are with a large group of Alaguali, whom they had probably joined the previous year. Individual Napa people come to the mission in later years in the company of Tolena and Canicaymo (Caynus?) peoples.

Another North Bay visit occurred in the summer of 1815, probably to coax the remaining peoples to come to the mission. This visit is recorded under the entry for 80 year-old Narcisa (San Francisco de Assis baptism #5162).

Dia 7 de Junio de 1815 en la Rancheria de los Chucuienes, adonde fui e pasear con el R. Fr. Narciso Duran Ministro de La Mission de San Josef en la lancha. Bautize privadomente a una mujer como de 80 anos llamada le puse por nombre Narcisa, es de crepita a la que es regular no se le suplan las ceremonias, balantaremente medejo el la Bautizara porque se moriria alli ... ... (?) ...

Ramon Abella

Soon after after arriving at Mission San Jose Napa widows were being married to mission residents, usually widowers themselves. Zaquenemaye (San Jose baptism #2838) was baptized on January 11, 1815. Three months later she married a 41 year-old Tuibun widower named Ildefonso (San Jose *Casamientos* #880). The Tuibun are the home tribelet of the Mission San Jose area.

Missions San Rafael and San Francisco de Solano

In 1817 most of the population at Mission San Francisco de Assis were removed to a new establishment at San Rafael. This new mission had little effect on the Napa Valley area, drawing most of those baptized from the Petaluma Plain and to the north and west.

The Caymus and Ululato came in large numbers to Mission San Francisco de Assis in 1821, at which time it was supposedly in a state of disrepair. It is probable that they were settled at the mission cattle ranch of San Ysidro de los Juchiunes, later to become the Castro rancho of San Pablo.

By the time of the founding of the Mission San Francisco de Solano, the North Bay, south of a line drawn between Cotati, Glen Ellen, Yountville and Vacaville, had been stripped of its peoples. That the few who refused to come to the missions were physically coerced, and even murdered was substantiated in the report received by Father Altimira in his 1823 visit to the Suisun Plain. Five captains and fourteen warriors from Libayto (Winters) told the following account to Altimira:

> Several days ago there came here an Indian from San Jose called Ildefonso with many mission Indians armed with bows, spears, and 2 guns, saying that they had come to hunt fugitives. They went to the Ululatos and the Indian Ildefonso told them that they must come to San Jose and be made Christians, that Father Narciso was summoning them, and if they did not respond, the Father from San Francisco would come to get them, and they would suffer much because they would be severely chastised. The Ululatos, Christians and gentiles, resisted, saying they did not want to, whereupon they held them up, robbed them and beat them. We being afraid, ran away and escaped. They then went to the rancheria of the Chemocoytos, fought, killed five men, and wounded another. Afterward they went to another rancheria, called Sucuntos, and killed all the people. They carried off many gentiles by force and shipped them away. They went to another rancheria on an island called Ompimes, and then we saw no more of them.

> They were here three days and nights. Your Christians, Ululatos, Suisunes, and the gentiles unbound each other and set out for the Tulares, for which reason they are here. All of us are fatigued and dispersed. (Altimira to Senan, in Cook 1943:77)

Altimira, a young priest and new to California, protested such actions to his superior, mentioning Father Amoros of Mission San Francisco de Assis and Father Narciso Duran of San Jose. The following passage clarifies much of the history that we have been following indirectly through the mission records:

> It is an old scandal the way he (Duran) operates in this matter. A thousand times I have heard mentioned his outrageous and arbitrary sorties, in which he goes out, or sends a large body of neophytes. (Altimira to Senan, in Cook 1943:77)

Ildefonso was probably the same man who married Zaquenemaye of Napa in 1815.

The new mission of San Francisco de Solano converted only about 1000 gentiles in ten years. The last of the near Canicaymo group (Mayacma, Huiluc, Canijolmano and Caymus) came to the mission with their relatives from Pope Valley (Aloquiome), Middletown (Loaquiome) and Chiles or Wooden Valley (Chemoco). The last Ululato came from Vacaville and many Libayto were brought in from Winters. In the two years before the closing of the mission many small groups were arriving from Alexander Valley and the Cobb Mountain area, including Polnomanoc (Pipohoma of Map 3), Uatsnomanoc (Unutsawaholmanoma of Map 3) and Atenomac, alias Canisizo (Tekenantsonoma of Map 3). Other small groups were being taken in from many large villages to the north and east of Winters.

It was the habit of the missions to use entire valleys for the purpose of raising a single type of stock. A special rancho of Santa Eulalia was maintianed in the Suisun area as a cattle ranch. It is probable that Rancho Carneros (Mutton) along Carneros Creek to the southwest of Napa, was the Mission San Francisco de Solano sheep ranch. Horses were probably raised nearer to the mission, in the Sonoma area.

Preparation had been underway in the Spanish government for the secularization of the missions since 1821. In anticipation of this, Mariano Guadalupe Vallejo arrived from the south with ten couples in 1833. Seeking to prevent a take-over of mission lands, the priest of Mission San Francisco de Solano sent Indian leaders to Petaluma

and Santa Rosa to occupy the sites.

The Vallejo Era, 1833-1846

Despite the efforts of the priest, Mariano Vallejo was soon in control of the North Bay. He was granted Rancho Petaluma in June of 1834. This was the first overt disregard of Indian land rights in the North Bay. According to Spanish law the Indians were to be at the missions only temporarily and were to have eventually been resettled on their lands. This was also the theory of the secularization order. The flaw in the design was the provision which allowed the government to transfer those lands not in use by the Indians to deserving Mexican citizens. As the California landscape became parceled into large ranchos, the government authorities dutifully excluded the sites of local Indian villages from the surrounding grant, reserving it to the control of the local Indian leader. The surrounding land upon which the Indians depended for their livelihood was considered "land not in use".

Vallejo received the right to grant ranchos in the North Bay in 1835. The first grant in the Napa Valley was to George Yount in 1836 at Caymus. In the next eight years the entire valley was carved into ranchos. C. A. Menefee (1873:18-19) noted the Indian populations that were settled at each of the ranchos:

> In 1843 there were from fifty to one hundred on the Bale Rancho, four hundred upon the Caymus Rancho, six hundred upon the Salvador Rancho, a large number on the Juarez and the Huigera Ranchos, and a still larger number at Soscol.

This information was probably received from George Yount, who tells in his "Chronicles" (1923) of his alliance with the "wild" Caymus Indians. The majority of the Caymus had actually been at the missions for ten years, and any Indians living in 1843 in their own former homeland in the Napa vicinity, whether at Las Trancas (Nap-14), Tulucay (Nap-39) or Suscol (Nap-16), had been at the missions since 1815-1816. The Menefee figures indicate an Indian poulation of about 2000 in the Napa Valley between Suscol and Oakville (the Bale Rancho of Canijolmano or Carne Humana) in 1843. Despite the depressed birth rate and extensive disease, including the smallpox epidemic of 1837 in which "nearly 70,000 Indians perished in Marin, Napa, Solano, Sonoma, Mendocino, and Humbolt Counties..." (Lauf 1916), this population approximates the probable pre-mission number. It may be that Yount over-estimated, but it is also certain that many of the people were mission converts from the north and east who had settled in the valley.

The Indian peoples were suspended between cultures. Disease and the power of the Spanish had eroded faith in, and ability to function within, the framework of their own native cultures. Lack of tradition, and more importantly, lack of land title and access to tools, precluded them from joining the new culture. They had little choice but to become the workforce of the land grant owners.

Vallejo made a name for himself by securing the northern frontier agains the Indians. In three major compaigns of 1834, 1836 and 1841, he was able to defeat various combinations of tribelets, all of whom were from areas north of Mount St. Helena, Berryessa Valley, or northeast of Winters. He was able to maintain his position only by being allied with the Canicaymo group under Daniel, and the combined Suisun-Napa under Francisco Solano. In 1839 he created a special standing troop of 42 Suisun and Napa (Vallejo n.d.). None of the various Indian leaders which Vallejo mentions in his "Historia" are recorded in the mission records as being baptized as members of the Napa tribelet. This corresponds with the failure of the mission records to name the captain of the Napa. It may be that the Napa captains had died even before the group was taken into the mission in 1815.

Some of the Spanish families in the San Jose area were engaged in the practice of coming to the North B y to steal Indian children for use as servants. One such family were the Castros. In the late 1830's Chief Solano was found to be participating in this trade. Vallejo (n.d.) states that he was petitioned "by a group of Napaho Indians whose boys and girls had been stolen and they asked that the great criminal who had filled their rancheria with mourning should be removed from the position he occupied and that his place should be entrusted to another headman who would have more respect for treaties and the sentiments of love for one's fellowman". At least that is the way Vallejo recalls the matter. Solano was chastized but not removed from his position as headman.

The above incident occurred after the time in 1837 that Zampay, an Indian from Woodland, attempted to win over the Napa in a power struggle against Solano for leadership of the Suisun. These various incidents reveal a situation of continuing intrigue in which Vallejo manipulated the ancient rivalries of the various tribelets, more specifically the alliances and enmities among inter-tribelet extended kin groups.

The American Period

The Americans recognized the farming potential of the Napa Valley before the Gold Rush. The Vallejos sold-off parts of their grants in order to encourage American settlement. Jacob Coombs surveyed the lots of the City of Napa in 1848, even before the report of gold in the Sierra Nevada. The 1850 census of Napa County records approximately 415 persons. Only two of the families in the county were Mexican. Nicholas Higuera, the grantee of Entre Napa, is listed as "Nicholas Agara", Cayetano Juarez of Tulucay is also listed, as "Gaidan Juares" (Bowman 1972). Of the other early grantees, George Yount and his family are listed as well as the two sons and four daughters of Edward Bale, owner of Rancho Carne Humana, who died in 1849. Damasio Rodriguez of Rancho Yajome died *ca.* 1846. Salvador Vallejo was living elsewhere in 1850. The Indian population, which was not listed in the census, was probably declining rapidly, but certainly far outnumbered the white population.

> Down to 1856 they thronged the streets of Napa City in great numbers, especially on Sundays, picking up odds and ends of cast-off clothing, occasionally fighting and always getting drunk if the means were procurable. Male and female, they encumbered the sidewalks, lounging or sleeping in the sun, half clad and squalid--pictures of humanity in its lowest state of degredation. Now an Indian is scarcely to be seen (Menefee 1873: 18).

Under the rule of the Spanish, the Indians had been afforded at least some protection by the patronage system. The Americans who bought the lands of the original ranchos did not even recognize the natives' rights to their own villages. Those Indians who survived the new strains of diseases brought by the Americans, malnutrition, and physical harassment, may have followed the lead of Chief Wi'-kom, and moved to Patwin settlements to the north.

Chapter 3

Research Perspectives / Research Methodologies

As an attachment to the contract for the completion of archaeological studies at Nap-261, the Corps of Engineers established a basic framework for the studies which consisted of a collection of "research and excavation designs" prepared by Dr. David A. Fredrickson, Co-ordinator of the District 01 Clearinghouse of the Society for California Archaeology, Department of Anthropology, California State College, Sonoma. These research designs had been prepared for the Corps of Engineers under a previous contract and were completed in March of 1976 (Fredrickson 1976).

Since much of what will be the basis for discussion in this report is based upon the research designs forwarded by Dr. Fredrickson, the specific nature of his proposal will be described at length. After a brief review of the ethnographic and archaeological setting of the Napa region, Fredrickson suggests the following:

> The following are illustrative of important archaeological questions relevant to the Napa region that might be addressed with information gained from the scientific investigation of CA-Nap-261.
>
> (1) Social and temporal boundaries of Wappo-Patwin use of the area.
> (2) Clarification of late period development in the Napa region.
> (3) Social, cultural, and ceremonial relationships between Napa region groups and groups of adjoining regions.
> (4) The relationship of the site to its biophysical context and the determination of activities conducted at the site.
> (5) The relationship of the site to other sites in the region with respect to a total settlement system.
> (6) Developing complexity of intergroup relationships as indicated by the exchange system, intragroup sociopolitical organization and religious practices.
> (7) In addition to the above, investigations of CA-Nap-261 would be expected to enlarge the artifact inventory and to provide midden constituent data useful for future comparative studies (Fredrickson 1976:7).

Proposed Excavation Design

Fredrickson (1976:8-9) follows his general discussion of potential research questions with a more detailed outlined of the sorts of data which should be recovered in the course of archaeological excavations in order to address those problems. Among these he includes the recovery of materials for chronometric dating, cross-dating and the analysis of quantitative material changes in the stratigraphy of the site. As a means of addressing the problems of biophysical and adaptive relationships, he suggests the collection of data on midden constituents, artifacts and features with inferrable functions, materials which appear foreign to the area and therefore possibly indicative of exchange and the accumulation of data which might serve to define the local resource base. Specific questions regarding on-site activities, he suggests, might be addressed by the analysis of artifacts and features and their associations and by the analysis of midden constituents and their distribution. The research issue of exchange and trade might be investigated by directing attention to the definition of what materials in the site are non-local (imported) and those which are available in the local resources base and which might have served as export items. Religious and ceremonial questions could be addressed by the investigation of mortuary complexes and the study of artifacts which are not in such association but which have inferrable ceremonial function. Research questions surrounding the issue of group identity and status identity might also be resolved by the collection of data which, either taken as a definable co-association of attributes or assemblages, or which taken as the definition of status by the occurrence of inferred wealth items as mortuary associations, have been applied in this regard in other areas. Finally, Fredrickson suggests that close attention to the nature of and possible change in basic inventories of artifacts, features and other constituents may lead the researcher at Nap-261 to discern changes in the internal composition of the midden and to allow the researcher to make comparative analyses between Nap-261 and other sites in the Napa region.

Given the above orientation and taking into consideration tne fact that the site is highly disturbed and that the site would be totally destroyed with the completion of the proposed flood control project, Fredrickson proposed that an excavation program be undertaken which included the excavation of ten (10) "controlled excavation units" measuring 1 by 2 meters in size, excavated in arbitrary 10 centimeter levels (unless stratigraphic considerations should dictate otherwise), with the recommendation that the soil from the units be washer screened through 6mm mesh. These units should be located in those areas of the site which suggest the opportunity for optimal data recovery (Fredrickson 1976:10).

According to Fredrickson, the purpose of the controlled excavation would be:

> (a) To obtain a representative sample of cultural constituents, including both artifacts and ecofacts (e.g., stone chipping debris, faunal and molluscan remains).
> (b) To expose and record archaeological features (e.g., hearths, housefloors) that might be encountered.
> (c) To define and record archaeological soil profiles.
> (d) To obtain archaeological samples appropriate for dating by the radiocarbon method and for other technical studies, e.g., obsidian hydration and source analysis studies.
> (f) To provide observations necessary for describing internal organization and physical structure of the archaeological site (Fredrickson 1976:10-11).

Fredrickson also recommended the excavation of what he termed, "trenches":

> It is recommended that a series of trenches, measuring one meter in width, be excavated. The actual number of trenches should be determined on the basis of the field experience. Trenches need not be governed by the same controls as the controlled excavation units, since they are designed to provide different levels of information. While provenience data on artifacts, features, and other archaeological phenomena sgould be recovered, the use of shovels, an arbitrary excavation level greater than ten centimeters, and a screen mesh greater than 6 mm would be acceptable. Washing of screenings would not be necessary.
>
> Trenches should be located to optimize recovery of data on:
>
> (a) Stratigraphic relationships between various portions of the site and pertinent soil profiles.
> (b) Degree of disturbance and relative integrity of different areas of the site.
> (c) The distance that the site extends away from the river bank.
> (d) Archaeological features that might be encountered during trenching. Such features should be excavat-

ed by techniques deemed appropriate by the field situation.
(e) The internal organization and physical structure of the site.
(f) To expand the artifact inventory.
(g) To increase the opportunity to recover unique or rare materials.
(h) To provide qualitative data on midden constituent variability (Fredrickson 1976:11-12).

Fredrickson also suggested a "rapid recovery" program be undertaken at the site, essentially utilizing mechanized equipment to study gross aspects of the site and gain at least some information from areas of the site not excavated under more controlled circumstances before destruction by the proposed flood control project. This aspect of Fredrickson's proposal was not acted upon. As a final phase in the recovery of scientific data from the site, Fredrickson recommended monitoring of construction activities. Whether this or the "rapid recovery" program will ever be realized is problematic at this time.

It may be seen, then, that Fredrickson's proposal provides a framework for the scientific investigation of Nap-261 which is reasonably sound and well founded in both archaeological method and theory. Fredrickson's familiarity with the resources of the archaeological record of the Napa Valley area allowed him to integrate all aspects of the archaeological portential of the site, based on available data at the time his proposal was written, with the discernable anthropological problems at hand for the region.

At the time the subject studies were undertaken every effort was made to see that Fredrickson's proposal would be addressed in every detail. Unfortunately, a series of events were to occur which prevented the completion of planned excavations and data recovery at the site and which acted to modify our approach to the recovery of data during excavations.

Suffice it to say that an issue before the Napa voters was defeated and with this defeat it appeared that the completion of the proposed flood control project was in jeopardy. Negotiations between the contractor and representatives of the American Indian Movement and the Suskol Tribal Council had reached the accord that insofar as the site was in jeopardy of destruction by the proposed flood control project, data recovery operations could proceed. With the defeat of the bond issue, it appeared to some members of the local Indian community that the site was no longer jeopardized and that archaeological studies were no longer warranted, especially since the presence of human remains in the site had been verified. At the

request of representatives of the Suskol Tribal Council and the American Indian Movement, the Corps of Engineers ordered archaeological studies halted on November 5, 1976. The order was complied with immediately, resulting, however, in the loss of considerable archaeological information. Also, at the request of the Indian community, human remains discovered in the course of excavations were not removed from the site.

Research Methodologies

Field Studies

Map 5 illustrates the relationship of Nap-261 to the Napa River and indicates features which have resulted in the disturbance of the site. Figure 3 shows the distribution of excavation units at the time work was halted. As mentioned previously, the distribution of the units was made in conformance with Fredrickson's proposed excavation design.*

Immediately upon commencement of excavations at the site, it was found that the upper 30 centimeters of the cultural deposit had been compacted to a degree which required the use of pick and shovel for the removal of the midden, alsong with an assortment of small hand tools, principally trowels. Excavation with hand tools alone was a simple impossibility given the circumstances. An attempt was made in several units to soak the soil with water overnight. While this had the positive effect of loosening the upper 3 to 5 centimeters of a given level, the experiment proved unsuccessful inasmuch as it rendered the wetted soil nearly impossible to screen, except in washer screens.

All units at the site were excavated in arbitrary 10 centimeter levels with all soil from the excavation of the upper 30 centimeters in all units being dry-screened through 6 millimeter mesh rocker screens. Units N106/E102, N107/E94 and N106/E102 were excavated with soil screened through 6 millimeter mesh in the upper 30 centimeters and with the soil below 30 centimeters to the culturally sterile submidden soils being sifted through 3 millimeter mesh and washer-screened. The upper 40 centimeters of Unit N106/E87½ were dry-screened through 6 millimeter mesh with the two remaining levels (to 60 cms.) being wet-screened through 3 millimeter mesh. All other units were dry-screened using 6 millimeter mesh. Excavation was by shovels, picks and hand

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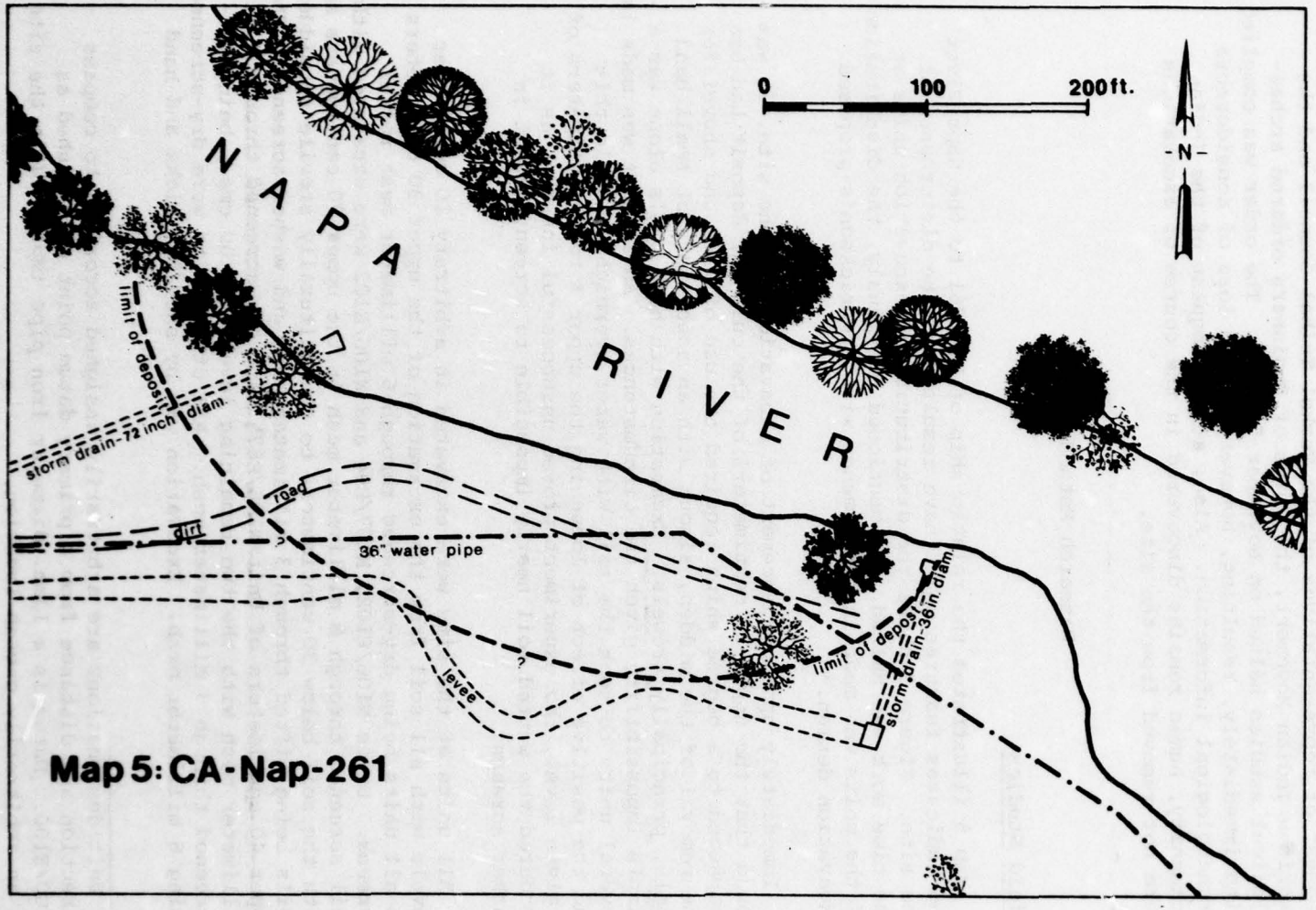
* Unit designations are arbitrarily assigned according to compass direction and distance from a primary datum point established as N100/E100. Datum is a 13mm. diameter iron pipe implanted in the site at an arbitrarily chosen location.



Map 5: CA-Nap-261

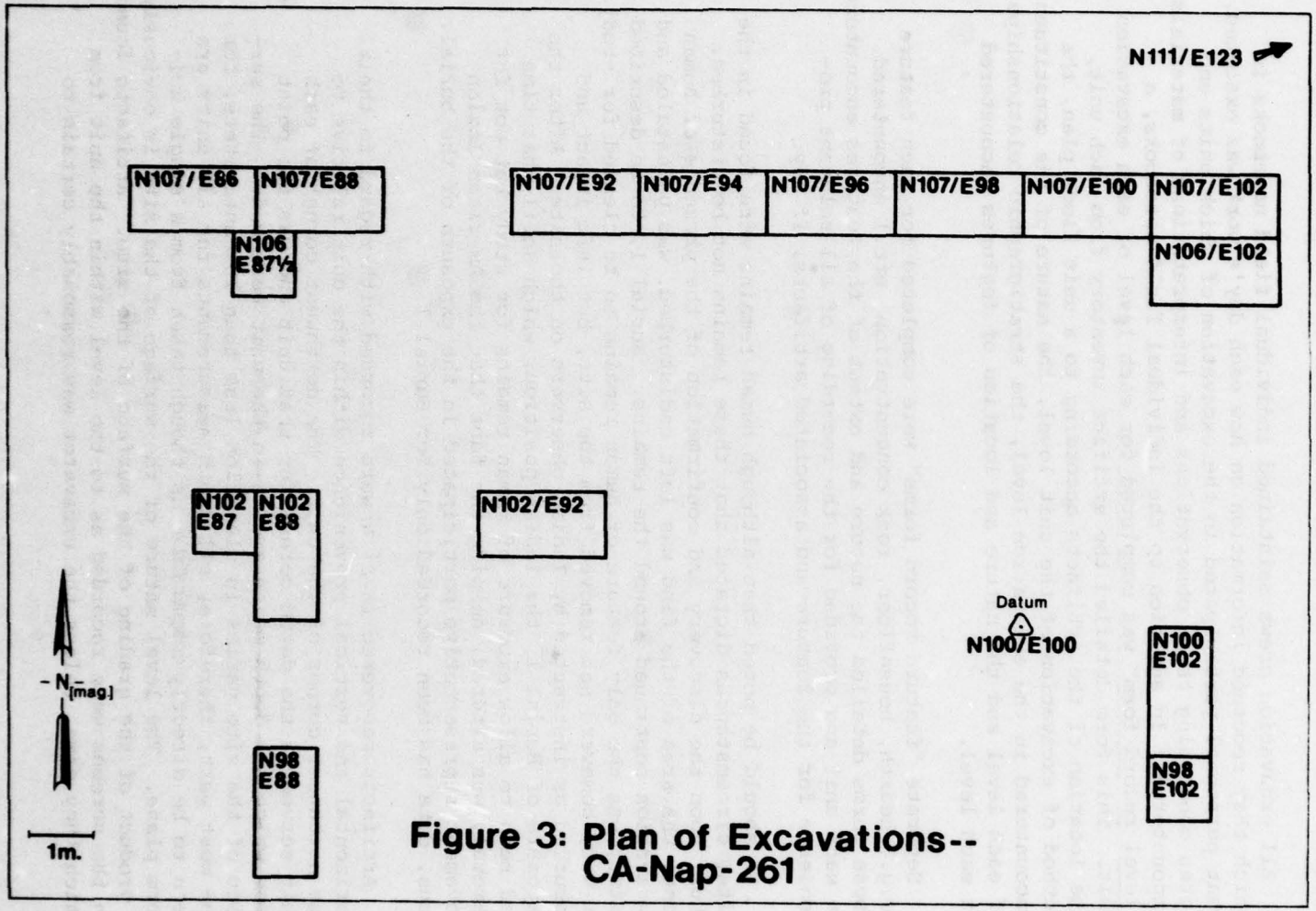


Figure 3: Plan of Excavations--CA-Nap-261

tools.

All excavation crews maintained individual field notebooks in which they recorded information on how each day's work was executed, what personnel participated in the excavation of which units and notes concerning their observations and interpretations of materials encountered. In addition to the individual field notebooks, a "level record form" was completed for each level of each excavation unit. This form detailed the artifact inventory from each unit, the location of the artifacts according to a unit floor plan, the method of excavation of the unit level, the nature of the constituents encountered in the excavation level, the stratigraphic relationships of each level and the nature and location of features encountered in each level.

Seperate "feature record forms" were completed for each feature (e.g., hearth, housefloor, rock concentration, etc.) encountered. These forms detailed the nature and extent of the features encountered in each unit and provided for the recording of all relevant provenience for the feature and associated artifacts, if any.

It should be noted that although human remains were found in the site, circumstances dictated that these remains not be disturbed. Thus, upon the discovery and confirmation of the presence of human bone, the area of the find was left undisturbed, was pedestaled and excavation continued around the remains. Burial 1, to be described later, was the only feature of human remains to be cleared for study. It was, however, not removed from the site, but left intact and reburied as instructed by Indian observers on the site. After the exposure of Burial 1, the Indian position, which until that time had been to allow exposure of human remains for study but not for removal, was altered, despite the fact that the American Indian Movement representative participated in the exposure of the burial. Thus, data has been recorded only for Burial 1.

Artifacts recovered *in situ* were recorded with regard to their horizontal and vertical provenience within the unit relative to the northwest corner of the unit. The northwest corner of each unit served as the datum corner for that unit and was the point from which all depth measurements in the unit were made. The surface of the site varies in elevation less than 10 centimeters, for the most part, therefore, all depth measurements for all units are seen to be directly comparable, as though taken from a single uniform plane. The level nature of the surface of the site is obviously a product of the grading of the surface of the site. Artifacts found in the screens were recorded as to the level within the unit from which they came, unless the excavator was reasonably certain to

within an area of some 25 by 25 centimeters as to where the artifact had rested.

"Level bags" were kept for each level of each unit. Into these were placed all non-artifactual remains recovered from the shaker screens with the exception of thermally-fractured rock and organic debris such as roots, leaves and twigs. Special attention was paid to the recovery of all obsidian and faunal debris. These level bags were returned to the laboratory for analysis and served as the basis for the study of macro-constituents from the site.

When encountered, potential radiocarbon samples were collected. In all cases these samples proved to be charcoal or charcoal-laden soils. Six samples were collected, of which two appear to be of sufficient mass to allow a radiocarbon assay (Teledyne Isotopes communication May 1977). These samples will be discussed further in Chapter 5 of this report.

It was the intention of the data recovery program to collect a considerable number of soil samples in the course of excavations. However, with the unexpected termination of the fieldwork, only a few samples had been taken. Collection procedures for both the general soil samples and the collection of carbon samples followed a similar procedure. The area to be collected was isolated by the use of clean hand tools (trowel and smaller dental tools, etc.). A block of soil was then removed from the surrounding matrix and quickly placed into clean plastic bags. In the case of carbon samples, these were placed into foil and then into bags. Samples taken for flotation analysis, or the recovery of micro-floral remains were bagged in clean paper bags. Palynological samples were double bagged. Samples were also collected from ash features. Soil samples were collected from the folowing units (depth given):

N100/E102	50-70 cms.	ash on housefloor for C-14
N100/E102	50-70 cms.	second ash feature on housefloor - C-14
N102/E87	60-67 cms.	charcoal-rich midden in association with mortar fragments; for C-14
N107/E102	70-80 cms.	midden w/ charcoal at midden base; for C-14 (DATED SAMPLE)
N107/E100	90-100 cms.	midden w/ charcoal at midden base; for C-14 (DATED SAMPLE)
N107/E96	60-80 cms.	midden w/ charcoal; for C-14
N107/E102	62-69 cms.	midden w/ charcoal; for C-14
N102/E88	10 to 80 centimeters,	comprising 6 samples; see Appendix 3; pollen study
N98/E102	50-60 cms.	and 60-70 cms. ash samples from feature

N107/E92 0-10 and 10-20 cms. soil sample for pollen and micro-floral study
N100/E102 50-70 cms. ash sample for general study
N107/E100 60-70 cms. submidden soil for comparison

All features found in the course of excavations were photographed. A single lens reflex 35mm camera and a 120mm format camera were employed. A log of photographs taken was maintained which indicated the subject and identification of frames exposed for the subject.

With the completion, or near completion, of the N107 series of units, the opportunity seemed ripe for the compilation of a detailed stratigraphic record for that portion of the site. It was, unfortunately, at this time that work was halted. Likewise, a plan for the analysis of thermally-altered rock from the site could not be carried out. This plan called for the study of all such rock from selected units. The required backfilling of the excavation units eliminated access to the proposed object of the study.

Laboratory Studies

Artifactual and constituent materials were analyzed shortly after their recovery in the field. Artifacts with the exception of mortars and pestles were washed and catalogued. The artifact collection will be accessioned in to the collections of the Anthropology Laboratory, California State College, Sonoma, under the accession prefix '77-14'. Mortars and pestles were not cleaned in order that pollen samples might some day be recovered from the soils adhering to them. Only prehistoric artifactual materials, with the exception of one glass bead, were catalogued. All historic material was found to be of such recent vintage and of such nondescript character as to be not worth cataloguing. This material has been, however, retained with the constituent materials recovered from the excavation units.

All non-artifactual materials, i.e., midden constituents collected in the level bags, were washed, sorted, counted and weighed. Materials slated for special studies, fish bone and other vertebrate remains were separated and sent off for analysis by specialists. Results of the analyses of these materials will be discussed in Chapter 4 of this report.

Obsidian collected from the site was the object of two seperate laboratory studies: trace element analysis using X-ray fluorescence spectrography to determine the source of the material and, obsidian hydration studies in an effort to ascertain the relative ages of certain specimens.

All obsidian samples selected for obsidian hydration analysis were also subjected to X-ray fluorescence (XRF) analysis. According to the provisions of the contract, a maximum of two samples per excavation level could be studies. Samples were selected accordingly and were also selected to assist in the age determination of selected features and artifacts.

Obsidian hydration rim measurements were completed on 100 samples from Nap-261. The specific results of these analyses will be discussed in Chapter 5 of this report. Procedures for the preparation and reading of the hydration rims follow standard procedures as discussed by Michels (1973:205ff) and others (cf. Clark 1961a, 1961b, 1964; Dixon 1970; Evans and Meggers 1960; Friedman, Long and Smith 1963; Friedman, Smith and Clark 1969; Hester 1973; Johnson 1969; Layton 1972a, 1972b; Michels 1965a, 1965b, 1967; and, Michels and Bebrich 1971). Thickness of the hydration rim was measured at at least three points along the rim. An average rim thickness was then computed. These procedures were executed by T. Jackson.

XRF analyses were completed at the Department of Geology and Geophysics at the University of California, Berkeley, by T. Jackson. Samples were analyzed semi-quantitatively (rapid scan) for the trace elements rubidium (Rb K-alpha), strontium (Sr K-alpha), Yttrium (Yt K-alpha), zirconium (Zr K-alpha) and niobium (Nb K-alpha). A Norelco (Philips) Universal Vacuum Spectrogrph (X-ray) with a tungsten radiation tube, a Lif (220) analyzing crystal, scintillation detector with pulse height discrimination and an air path was used. Results of the XRF analyses will be discussed in Chapter 5. Tabulation of the results are offered as Appendix 4. All obsidian from the site is ultimately derived from the Glass Mountain source near St. Helena, although it is likely that a major portion of the material is derived from secondary and tertiary sources rather than from the Glass Mountain source itself (see Chapters 4 and 5).

Special faunal studies were completed by Peter D. Schulz and Dwight D. Simons, doctoral candidates in anthropology at the University of California at Davis. Results of their studies are presented as Appendices 1 and 2. Pollen studies were completed by Pollen Research Associates, Inc., of San Mateo, California. A report of their analyses is presented as Appendix 3. The results and implications of these analyses will be presented in Chapters 4 and 5.

Analyses of artifactual and other remains from Nap-261 were directed toward the solution or toward the contribution to the solution of the research problems forwarded by Fredrickson (1976) and as discussed earlier in this chapter.

Chapter 4

Description of Site Constituents

This chapter will serve to discuss the nature and distribution of those constituents which compose the midden of Nap-261; this includes the discussion of artifactual as well as non-artifactual materials.

The Midden

Excavation of units at Nap-261 provided the opportunity to observe and record some features of the general stratigraphy of the site. Figure 4, offers an example of a "typical" sidewall profile, in this case the north sidewall of unit N107/E92. In most units the uppermost 30+ centimeters made up the layer of "compacted disturbed midden" seen to be somewhat more shallow in this unit than in many others. The upper levels of the site have been compacted by recent vehicular traffic over the site surface and no doubt by several decades of a variety of abuses of agricultural and construction origin. The compacted upper midden is generally a grey-brown to brown color, obsidian, thermally-altered rock, shell and small amounts of bone characterize this layer's surface. As with the entire depth of the site, the layer is thoroughly churned by rodents.

Beneath the layer of disturbed midden is a layer of what appears to be relatively intact midden, a darker grey-brown color and more friable and with considerably less in the way of recent historic debris. Midden constituents (see Table 5) are generally similar to the layer above (with a lesser amount of historic material). It may be noted from Table 5 that there is an increase in the weight/count of shell in the lower levels. This is believed to be more a product of preservation conditions than a factor suggestive of cultural change.

In most units excavated at the site,evidence of culturally sterile yellow clay begins to appear at the 50-60 centimeter level. The clayey sub-midden soil is an excellent indicator of the amount of rodent disturbance which has occurred at the site. The grey-brown midden soil is easily recognizable in the krotovina which penetrate the sub-midden clays. A glance of the various provenience tables for artifacts will allow the reader to ascertain the depth to which each unit at the site was excavated (e.g., Table 7). A question mark on the table indicates the unit was not completed to sterile, a point regarded to be that level in the unit dominated by yellow clayey soil and generally devoid of artifacts not found in krotovina.

Table 5: Summary of Macro-constituents from CA-Nap-261

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N98/E88	0-10	obsidian	47	30.0
		chert	1	0.1
		basalt	3	26.7
		bone	2	0.6
	10-20	obsidian	44	41.2
		chert	1	0.8
		basalt	5	9.4
		quartz	1	2.0
		bone	1	0.1
	20-30	obsidian	47	26.6
		basalt	1	15.5
	30-40	obsidian	41	27.0
		bone	1	0.3
	40-50	obsidian	49	39.5
	50-60	obsidian	41	39.5
		chert	1	0.5
N98/E102* (1x1 meter unit)	0-10	obsidian	13	17.0
		basalt	3	16.0
		round nail	1	-
	10-20	obsidian	3	1.0
		modern glass	2	5.9
		metal frag.	1	1.2
		tar	1	1.0
	20-30	obsidian	5	5.6
		bone	4	5.6
	30-40	obsidian	15	11.5
		bone	4	4.8
		linoleum frag.	1	0.7
	40-50	obsidian	23	28.9
		bone	4	1.9

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N98/E102 (cont.)	50-60	obsidian	3	2.5
		basalt	1	5.4
		bone	6	3.8
		nail frag.	1	2.7
	60-70	obsidian	32	5.0
		basalt	2	57.4
	70-80	obsidian	26	22.1
		bone	6	13.0
	80-90	obsidian	25	31.3
		chert	1	13.1
		bone	1	0.9
		shell (*M. edulis*)	3	0.2
		modern glass	1	0.9
N100/E102	0-10	obsidian	25	38.1
		basalt	2	19.8
		bone	3	0.6
		modern glass	1	6.8
	10-20	obsidian	121	119.3
		chert	3	26.6
		basalt	10	93.6
		quartz	1	0.8
		bone	1	1.2
		shell (*M. edulis*)	7	0.2
		pottery	1	2.0
		.22 cal. casing	1	0.6
	20-30	obsidian	109	104.9
		chert	2	20.9
		basalt	5	53.5
		bone	17	10.3
		shell (*M. edulis*)	2	0.1
		modern glass	4	1.9
		square nails	2	11.5
		metal frag.	1	0.8
		marble (toy)	1	6.7
		linoleum frag.	5	4.9
		.22 cal. casing	1	3.1

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N100/E102 (cont.)	30-40	obsidian	120	153.5
		bone	20	35.0
		shell (*M. edulis*)	2	0.3
		modern glass	1	0.3
		wire (metal)	1	7.9
		round nail	1	3.4
	40-50	obsidian	61	190.8
		chert	1	1.2
		basalt	3	63.7
		bone	39	20.7
		shell (*M. edulis*; *Ostrea* sp.)	18	2.0
		wire frag.	5	15.2
	50-60	obsidian	35	33.8
		bone	8	20.7
		shell (*M. edulis*)	7	1.5
	60-70	obsidian	41	52.8
		bone	4	9.4
		shell (*M. edulis*; *Macoma nasuta?*)	30	4.3
	70-80	obsidian	86	126.5
		bone	31	60.2
		shell (*M. edulis*; *Macoma ?*)	17	4.1
		square nail frag.	1	2.1
	80-90	obsidian	58	62.3
		basalt	3	24.0
		bone	28	33.6
		shell (*M. edulis*)	13	2.5
	90-100	obsidian	27	42.5
		bone	4	6.2
		shell (*M. edulis*)	4	0.2

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N102/E87*	0-10	obsidian	22	16.5
		basalt	1	30.8
		modern glass	1	3.3
	10-20	obsidian	27	21.7
		basalt	2	10.3
		bone	1	0.3
		shell (*M. edulis*)	1	0.1
		modern glass	1	0,3
	20-30	obsidian	5	6.5
		basalt	1	2.6
		nail frag.	1	5.1
	30-40	obsidian	34	18.8
		quartz	1	1.5
		square nails	2	9.2
	40-50	obsidian	62	47.9
		basalt	2	15.4
	50-60	obsidian	14	8.2
		basalt	1	1.9
	60-70	obsidian	11	15.9
	70-80	obsidian	13	9.0
N102/E88	0-10	obsidian	47	44.7
		chert	2	13.0
		basalt	2	31.6
	10-20	obsidian	78	78.0
		chert	4	27.0
		basalt	1	4.2
		tar	3	0.6
	20-30	obsidian	63	52.2
		quartz	1	0.3

* Only N½ of unit excavated

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N102/E88 (cont.)	30-40	obsidian	82	189.5
		basalt	2	87.9
		bone	6	18.1
	40-50	obsidian	59	38.0
		basalt	4	4.7
		bone	16	17.8
	50-60	obsidian	91	111.6
		chert	1	0.1
		basalt	2	27.8
		bone	14	24.6
		shell (*M. edulis*)	60	4.8
	60-70	obsidian	43	56.0
		basalt	1	0.7
		bone	6	3.7
	70-80 (S½ only)	obsidian	25	8.3
N102/E92	0-10	obsidian	0	0.0
		tar	1	-
		square nail	1	-
		modern glass	1	-
		.22 cal. casing	3	-
N106/E87½* (* 1x1 meter unit)	0-10	obsidian	38	27.3
		chert	3	24.2
		modern glass	1	1.4
	10-20	obsidian	34	31.1
		basalt	1	2.8
		shell (*M. edulis*)	1	0.2
		modern glass	1	1.2
		heater insulation	1	5.0
	20-30	obsidian	18	23.1
		chert	1	0.8
		basalt	1	1.2
	30-40	obsidian	23	16.4
		bone	1	0.9

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N106/E87½ (cont.)	40-50	obsidian	17	26.0
	50-60	obsidian	38	28.8
N106/E102	0-10	obsidian	93	66.8
		basalt	1	2.1
		bone	17	10.8
		modern glass	33	27.3
		nail frag.	1	3.0
		.22 cal. casing	3	2.3
		shell (*M. edulis*)	1	0.1
	10-20	obsidian	116	112.7
		bone	33	23.1
		shell (*M. edulis*)	2	0.1
		tar	4	3.5
		modern glass	4	9.2
		linoleum frag.	3	0.4
		bullet casing	2	9.5
	20-30	obsidian	70	97.5
		bone	9	6.1
	30-40	obsidian	107	164.0
		bone	51	32.9
	40-50	obsidian	93	103.0
		bone	60	65.7
N107/E86	0-10	obsidian	77	44.4
		quartz	1	3.2
		modern glass	24	16.4
		.22 cal. casing	5	3.3
	10-20	obsidian	97	68.7
		bone	4	1.9
		modern glass	1	0.3
		.22 cal. casing	1	0.6

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E86 (cont.)	20-30	obsidian	70	118.5
		chert	1	0.9
		basalt	2	8.8
		bone	1	1.9
		modern glass	1	1.5
	30-40	obsidian	85	86.5
		basalt	2	14.3
		quartz	8	15.1
		bone	2	0.5
	40-50	obsidian	56	53.7
		chert	1	2.1
		bone	8	1.9
	50-60	obsidian	59	77.5
		basalt	1	0.8
		bone	6	3.2
	60-70	obsidian	23	17.5
N107/E88	0-10	obsidian	47	46.4
		basalt	2	2.5
		bone	2	1.4
		modern glass	21	25.2
		.22 cal. casing	3	1.8
		heater insulation	3	124.8
	10-20	obsidian	84	47.2
		chert	1	1.8
		bone	2	1.0
		modern glass	16	10.1
		shotgun shell frag.	1	-
		.22 cal. casing	1	0.6
	20-30	obsidian	95	83.0
		bone	3	1.3
		modern glass	1	0.6
	30-40	obsidian	70	105.0
		basalt	6	177.6
		bone	3	1.1

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E88 (cont.)	40-50	obsidian	43	73.2
		chert	2	13.0
		bone	8	3.6
		modern glass	1	0.7
	50-60	obsidian	47	34.9
		chert	1	18.9
		bone	7	2.9
	60-70	obsidian	18	45.4
		bone	3	1.5
N107/E92	0-10	obsidian	83	68.6
		basalt	6	24.9
		chert	2	8.0
		quartz	1	0.2
		bone	7	4.2
		modern glass	11	9.4
		square nail	1	3.2
		.22 cal. casing	3	1.7
		metal frag.	2	8.2
		modern acorn	1	1.0
	10-20	obsidian	90	65.4
		basalt	2	19.5
		bone	5	2.4
		shell (*M. edulis*)	1	0.1
		modern glass	2	6.3
		insulation block	1	35.8
		metal wire	1	1.5
		.22 cal. casing	1	0.6
	20-30	obsidian	109	244.7
		bone	9	12.3
	30-40	obsidian	106	175.5
		basalt	3	6.2
		bone	12	7.9
		.22 cal. casing	1	0.6
	40-50	obsidian	51	42.6
		bone	17	12.0

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E92 (cont.)	50-60	obsidian	43	77.7
		bone	6	10.3
		shell (*M. edulis*; *Ostrea* sp.)	3	0.3
		modern glass	1	0.5
	60-70	obsidian	13	5.8
		chert	1	3.6
		bone	5	3.2
		shell (*M. edulis*; *Ostrea* sp.)	6	0.8
	70-80	obsidian	7	6.3
N107/E94	0-10	obsidian	82	78.5
		chert	1	19.8
		basalt	12	51.5
		bone	3	3.2
		tar	16	7.3
		metal wire	2	13.1
		tack	1	0.5
		fish hook (metal)	1	0.6
		lead fishing weight	1	6.8
		.22 cal. casing	1	0.7
		modern glass	6	9.7
		metal frag.	2	1.0
	10-20	obsidian	118	98.1
		basalt	4	41.9
		bone	7	11.4
		tar	3	10.6
		modern glass	2	0.6
		pottery	1	7.3
		metal frag.	1	1.1
	20-30	obsidian	59	230.0
		basalt	5	66.0
		chert	1	4.6
		metal frag.	1	3.8
	30-40	obsidian	138	269.5
		basalt	5	69.3
		bone	24	21.2
		shell (*M. edulis*; *Tresus* sp.; *Ostrea* sp.)	5/6.1	

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E94 (cont.)	40-50	obsidian	120	154.6
		chalcedony	1	10.7
		basalt	3	1.9
		bone	42	15.3
		shell (*M. edulis*; *Ostrea* sp.; *Macoma* sp.)	27	3.2
		tar	1	6.8
	50-60	obsidian	85	112.2
		basalt	2	2.5
		bone	2	2.5
		shell (*M. edulis*; *M. californianus*; *Ostrea* sp.)	17	1.7
	60-70	obsidian	72	40.9
		bone	1	0.2
		shell (*M. edulis*; unident. sp.)	4	3.1
N107/E96	0-10	obsidian	90	161.4
		chert	1	5.6
		basalt	6	40.6
		bone	8	10.6
		shell (*M. edulis*)	1	0.1
		modern glass	4	10.7
		.22 cal. casing	7	8.3
		metal bottle cap	1	1.9
		modern acorn	1	0.1
		tar	10	10.0
	10-20	obsidian	48	82.2
		chert	1	1.1
		basalt	7	36.7
		bone	3	2.0
		modern glass	2	9.2
		sq. nail/rd. nail	2	8.7
	20-30	obsidian	82	226.1
		basalt	2	61.9
		bone	1	0.4

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E96 (cont.)	30-40	obsidian	74	128.6
		basalt	12	201.9
		bone	14	17.8
		shell (*M. edulis*; *Ostrea lurida*)	14	1.7
	40-50	obsidian	28	59.7
		bone	2	3.9
		shell (*M. edulis*)	5	0.2
	50-60	obsidian	44	59.5
		bone	10	9.1
		shell (*M. edulis*; *Ostrea* sp.)	16	1.9
	60-70	obsidian	13	22.9
		bone	1	1.4
		shell (*M. edulis*)	21	4.0
	70-80	obsidian	6	82.8
		basalt	1	3.2
		bone	2	1.8
		shell (*M. edulis*)	3	1.7
N107/E98	0-10	obsidian	124	140.2
		basalt	3	15.1
		bone	3	0.7
		shell (terrestrial gastropod)	1	0.1
		tar	14	10.1
		modern glass	3	0.1
		square nail	1	2.5
		metal frag.	1	0.7
		iron bolt	1	25.3
		bottle cap	1	3.4
		.22 cal. casing	4	3.1
	10-20	obsidian	43	30.0
		chert	2	4.4
		basalt	1	1.3
		bone	10	8.6
		shell (*M. edulis*; *Ostrea lurida*)	3	0.7
		modern glass	3	2.6
		tar	3	0.2

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E98 (cont.)	20-30	obsidian	162	239.1
		bone	18	11.3
		.22 cal. casing	1	0.6
		modern glass	1	0.8
	30-40	obsidian	198	190.0
		basalt	4	27.6
		bone	83	67.1
		shell (*M. edulis*)	7	0.2
	40-50	obsidian	170	154.7
		basalt	4	5.0
		bone	57	29.5
		shell (*M. edulis*; *Ostrea* sp.)	16	1.5
	50-60	obsidian	95	197.5
		basalt	8	50.1
		bone	63	36.8
		shell (*M. edulis*; *Ostrea* sp.)	158	11.1
	60-70	obsidian	200	169.5
		basalt	1	2.3
		bone	93	81.8
		shell (*M. edulis*; *Ostrea* sp.)	93	10.2
	70-80	obsidian	18	16.2
		bone	26	21.5
		shell (*M. edulis*)	47	3.3
	80-90	obsidian	10	7.7
		shell	8	0.4

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E100	0-10	obsidian	75	86.2
		chert	4	8.3
		basalt	12	28.5
		bone	20	72.8
		shell (*M. edulis; Ostrea lurida*)	5	0.2
		modern glass	15	13.2
		.22 cal. casing	2	5.3
		square nail	1	4.2
		iron bolt & nut	1	19.9
		metal frag.	3	5.0
		tar	1	4.8
	10-20	obsidian	43	60.5
		chert	3	18.9
		basalt	10	96.3
		bone	32	21.7
		shell (*M. edulis; Ostrea* sp.)	16	1.5
		modern glass	1	0.2
		.22 cal. casing	1	0.5
		tar	3	4.3
		square nails	2	11.6
	20-30	obsidian	96	128.5
		chert	4	9.3
		basalt	28	78.1
		bone	9	1.9
		modern glass	1	0.3
		metal frag.	1	0.8
	30-40	obsidian	123	135.9
		chert	3	22.9
		basalt	6	24.0
		bone	38	17.6
		shell (*M. edulis*)	2	0.1
	40-50	obsidian	76	98.4
		chert	2	54.3
		basalt	8	13.6
		bone	14	46.0
		shell (*M. edulis*)	4	0.4

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E100 (cont.)	50-60	obsidian	57	109.8
		basalt	4	69.3
		bone	39	36.2
		shell (*M. edulis*; *Ostrea* sp.)	57	4.6
	60-70	obsidian	65	112.1
		chert	2	5.6
		basalt	8	83.6
		bone	25	40.3
		shell (*M. edulis*)	63	10.9
		modern glass	1	1.0
	70-80	obsidian	48	197.7
		basalt	2	28.2
		bone	23	14.0
		shell	24	4.0
	80-90	obsidian	22	34.7
		chert	2	15.6
		basalt	4	194.7
		bone	16	12.4
		shell (*M. edulis*)	12	1.5
	90-100	obsidian	5	19.0
		basalt	2	5.9
		bone	9	10.9
		shell (*M. edulis*)	9	1.9
	100-110	obsidian	8	3.4
		bone	3	2.1
		shell (*M. edulis*)	11	1.3
N107/E102	0-10	obsidian	72	99.5
		basalt	4	33.3
		bone	6	9.8
		shell (*Ostrea* sp.)	1	5.4
		modern glass	4	5.5
		square nail	1	4.8

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E102 (cont.)	10-20	obsidian	107	103.9
		chert	1	0.5
		basalt	7	15.7
		bone	23	11.9
		modern glass	1	3.0
		square nails	2	10.1
		metal wire	1	1.1
	20-30	obsidian	91	111.0
		basalt	3	3.3
		bone	9	4.0
		.22 cal. casing	1	0.6
		linoleum frag.	1	0.2
		metal frag.	1	29.5
	30-40	obsidian	157	173.6
		basalt	2	8.1
		bone	20	32.3
		metal frag.	1	0.9
		bottle cap	1	3.3
		square nail frag.	1	1.1
		modern glass	2	2.1
		tar	1	1.4
	40-50	obsidian	77	84.8
		basalt	3	8.1
		bone	17	35.7
		.22 cal. casing	1	0.5
		metal frag.	1	1.2
	50-60	obsidian	71	162.9
		basalt	3	18.6
		bone	12	10.5
	60-70	obsidian	171	303.5
		chert	1	0.4
		basalt	2	20.4
		bone	54	48.3
		shell (*M. edulis; Ostrea lurida*)	29	2.0

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N107/E102 (cont.)	70-80	obsidian	49	191.0
		basalt	2	33.2
		bone	20	8.9
		shell (*M. edulis*)	50	3.6
		metal frag.	1	0.3
	80-90	obsidian	51	40.9
		basalt	6	34.6
		bone	32	38.1
		shell (*M. edulis*	56	5.6
	90-100	obsidian	28	52.2
		basalt	3	13.9
		bone	15	37.3
		shell (*M. edulis*)	42	2.8
	100-112 (max.)	obsidian	6	6.1
		bone	3	1.8
		shell (*M. edulis*)	3	0.1
	70-100*	obsidian	4	6.6
(* material recovered from feature pedestal in unit)		basalt	1	5.6
		bone	6	2.2
		shell (*M. edulis*)	7	0.7
N111/E123	0-10	obsidian	194	206.9
		chert	1	0.6
		basalt	23	42.8
		bone	67	62.7
		shell (*M. edulis*; *Ostrea lurida*)	12	1.5
		metal wire	1	33.3
		steel brad	1	0.9
		.22 cal. casing	2	8.8
		square nail frag.	12	33.7
		modern glass	12	14.0
		plastic arrow nock	1	0.8
		metal frag.	1	1.6

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N111/E123 (cont.)	10-20	obsidian	213	85.4
		bone	20	10.1
		shell (*M. edulis*; *Ostrea* sp.; *Protothaca staminea*)	16	3.2
		cast iron	1	57.7
		square nail frag.	6	15.3
		metal frag.	4	5.1
		steel brad	1	0.9
		modern glass	5	9.8
		pottery	2	18.5
	20-30	obsidian	458	286.8
		chert	1	5.5
		basalt	13	29.2
		bone	89	38.7
		shell (*M. edulis*; *Ostrea* sp.; *Balanus* sp.)	38	10.8
		modern glass	27	12.9
		pottery	5	15.8
		square nail frag.	5	14.4
		round nail frag.	3	3.8
		metal frag.	2	1.1
		cast iron	1	37.4
	30-40	obsidian	150	115.0
		basalt	9	9.1
		bone	59	40.0
		shell (*M. edulis*; *Olivella biplicata*)	10	1.3
		metal tack	1	0.6
	40-50	obsidian	209	180.6
		chert	4	10.5
		basalt	15	207.1
		bone	182	63.8
		shell (*M. edulis*; *Balanus* sp.; *Ostrea* sp.)	112	9.3
		crab (Cancer)	1	0.2
		modern glass	1	1.8
		linoleum frag.	1	1.0

Table 5: Summary of Macro-constituents from CA-Nap-261 (cont.)

UNIT	DEPTH (cm.)	MATERIAL	COUNT	WEIGHT (gr.)
N111/E123 (cont.)	50-60	obsidian	18	5.0
		chert	1	0.3
		bone	32	51.1
		shell (*M. edulis*; *Balanus* sp.)	12	1.1

Thermally-altered rock was a common midden constituent at all levels of the cultural deposit. Unfortunately, circumstances did not allow for the collection of either qualitative or quantitative data on the amount and distribution of that constituent.

Macro-constituents

The term "macro-constituent" as employed here simply refers to all those components which made up the midden which could be seen without the aid of magnification. Table 5 summarizes the nature and distribution of the macro-constituents. These materials are those which were retained in the level bags from the excavation units.

Historic debris from the site is included as macro-constituents since it is confined to fragmentary remains of bottles, non-descript fragments of metal, tar, shell casings, metal wire, linoleum, iron nails, fired, unglazed pottery, glazed ceramics, fragments of bottles and the like. Nearly all of the historic material is believed to date to a period post A.D. 1930. Several square nails were found and two fragments of "black glass" were found as the only possible 19th Century artifactual items. The historic material is randomly distributed in the site and appears to comprise no discernable feature such as a dump. A molded glass bead has been entered into the artifact catalogue from the site as a potential trade item, although it seems quite likely that this object dates from the late American period in the Napa Valley. The value of the historic material is seen to be in its role as an indication of disturbance in the site.

For the most part, lithic constituents, with the exception of thermally-altered rock, are made up of obsidian, chert and basalt, with an occasional fragment of chalcedony or quartz. By far the most common constituent of this group is obsidian.

Table 6 indicates the results of a study which seeks to determine what percentage of the obsidian found at the site could have come directly from the source at Glass Mountain and what percentage may have been recovered from the Napa River as float material. The amount of obsidian with either a water-worn cortex or a cortex which is formed as a part of the natural cooling process of the rock is generally less than 50% of the total amount (exclusive of artifactual obsidian) of obsidian from the site. However, the vast majority of the obsidian which evidences any cortex at all is clearly from water-worn cobbles or pebbles. The suggestion, at least on the basis of constituent materials, is that the majority of the obsidian utilized at the site came from a secondary source, most likely the Napa River, and not from the primary source at the quarry at Glass Mountain.

Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX (C)	%C WATER-WORN	%C w/NATURAL CORTEX
N98/E88 -				
0-10	47	42.5%	100.0%	0%
10-20	44	34.1%	80.0%	20.0%
20-30	47	12.8%	100.0%	0%
30-40	41	31.7%	92.3%	7.7%
40-50	49	34.7%	82.3%	17.7%
50-60	41	31.7%	92.3%	7.7%
N98/E102 -				
0-10	13	30.7%	100.0%	0%
10-20	3	0%	0%	0%
20-30	5	60.0%	100.0%	0%
30-40	15	13.3%	100.0%	0%
40-50	23	60.8%	100.0%	0%
50-60	3	66.6%	100.0%	0%
60-70	32	37.5%	100.0%	0%
70-80	26	23.0%	100.0%	0%
80-90	25	36.0%	100.0%	0%
N100/E102				
0-10	25	44.0%	100.0%	0%
10-20	121	40.5%	95.9%	4.1%
20-30	109	33.9%	94.6%	5.4%
30-40	120	36.7%	100.0%	0%
40-50	61	47.5%	100.0%	0%
50-60	35	34.3%	100.0%	0%
60-70	41	51.2%	100.0%	0%
70-80	56	46.5%	92.5%	7.5%
80-90	58	29.3%	94.1%	5.9%
90-100	27	40.7%	100.0%	0%

Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX (C)	%C WATER-WORN	%C w/NATURAL CORTEX
N102/E87 -				
0-10	22	13.6%	100.0%	0%
10-20	27	33.3%	100.0%	0%
20-30	5	60.0%	100.0%	0%
30-40	34	38.2%	83.3%	16.7%
40-50	62	27.4%	100.0%	0%
50-60	14	35.7%	100.0%	0%
60-70	11	36.3%	100.0%	0%
70-80	13	53.8%	71.4%	28.6%
N102/E88 -				
0-10	47	29.8%	92.9%	7.1%
10-20	78	37.2%	93.1%	6.9%
20-30	63	38.1%	95.8%	4.2%
30-40	82	43.9%	100.0%	0%
40-50	59	22.0%	69.2%	30.8%
50-60	91	40.7%	97.3%	2.7%
60-70	43	27.9%	91.7%	8.3%
70-80 (S½)	25	24.0%	66.7%	33.3%
N106/E87½ -				
0-10	38	28.9%	100.0%	0%
10-20	34	35.3%	91.7%	8.3%
20-30	18	33.3%	83.3%	16.7%
30-40	23	13.0%	100.0%	0%
40-50	17	23.5%	100.0%	0%
50-60	38	7.9%	100.0%	0%

Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX	%C WATER-WORN	%C w/NATURAL CORTEX
N106/E102 -				
0-10	93	46.2%	100.0%	0%
10-20	116	37.9%	100.0%	0%
20-30	70	51.4%	100.0%	0%
30-40	107	70.0%	100.0%	0%
40-50	93	44.0%	100.0%	0%
N107/E86 -				
0-10	77	29.8%	100.0%	0%
10-20	97	36.0%	100.0%	0%
20-30	70	41.4%	100.0%	0%
30-40	85	17.6%	100.0%	0%
40-50	56	26.7%	100.0%	0%
50-60	59	38.9%	100.0%	0%
60-70	23	21.7%	100.0%	0%
N107/E88 -				
0-10	47	42.4%	100.0%	0%
10-20	84	42.5%	93.9%	6.1%
20-30	95	32.6%	100.0%	0%
30-40	70	40.0%	89.3%	10.7%
40-50	43	60.4%	96.1%	6.9%
50-60	47	38.2%	88.9%	11.1%
60-70	18	50.0%	44.4%	66.6%

Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX (C)	%C WATER-WORN	%C w/NATURAL CORTEX
N107/E92 -				
0-10	83	50.6%	100.0%	0%
10-20	90	44.4%	100.0%	0%
20-30	109	43.1%	93.6%	6.4%
30-40	106	55.6%	100.0%	0%
40-50	51	56.9%	100.0%	0%
50-60	43	37.2%	100.0%	0%
60-70	13	33.4%	100.0%	0%
70-80	7	28.5%	100.0%	0%
N107/E94 -				
0-10	82	39.0%	100.0%	0%
10-20	118	38.1%	100.0%	0%
20-30	59	61.0%	100.0%	0%
30-40	138	44.9%	100.0%	0%
40-50	120	26.7%	96.9%	0%
50-60	85	31.8%	100.0%	0%
60-70	54	9.3%	100.0%	0%
N107/E96 -				
0-10	90	42.2%	97.4%	2.6%
10-20	48	56.2%	100.0%	0%
20-30	82	45.1%	100.0%	0%
30-40	74	33.7%	100.0%	0%
40-50	28	39.2%	100.0%	0%
50-60	44	45.2%	100.0%	0%
60-70	13	23.0%	100.0%	0%
70-80	6	16.0%	100.0%	0%

Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX (C)	%C WATER-WORN	%C w/NATURAL CORTEX
N107/E98 -				
0-10	124	42.9%	100.0%	0%
10-20	43	30.2%	100.0%	0%
20-30	162	30.2%	95.9%	4.1%
30-40	198	25.2%	94.0%	6.0%
40-50	170	21.8%	97.3%	2.7%
50-60	95	17.9%	100.0%	0%
60-70	200	24.5%	100.0%	0%
70-80	18	61.1%	100.0%	0%
80-90	10	0%	0%	0%
N107/E100 -				
0-10	79	38.7%	100.0%	0%
10-20	43	72.1%	100.0%	0%
20-30	96	27.1%	96.1%	3.9%
30-40	123	35.8%	90.9%	9.1%
40-50	76	51.3%	92.3%	7.7%
50-60	57	31.6%	94.4%	5.6%
60-70		(not calculated)		
70-80		(not calculated)		
80-90	22	27.3%	100.0%	0%
90-100	5	80.0%	100.0%	0%
100-110	8	12.5%	100.0%	0%

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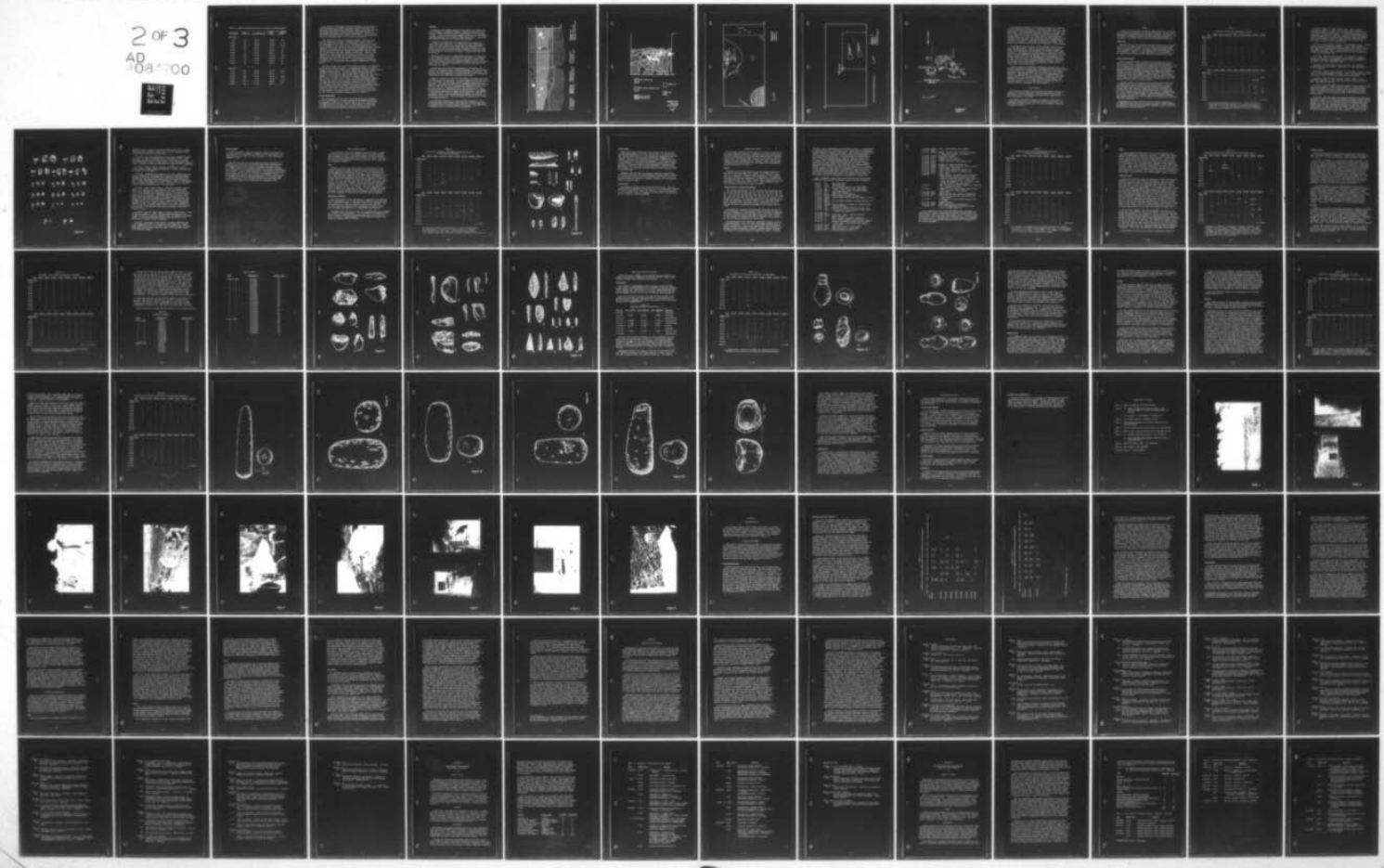

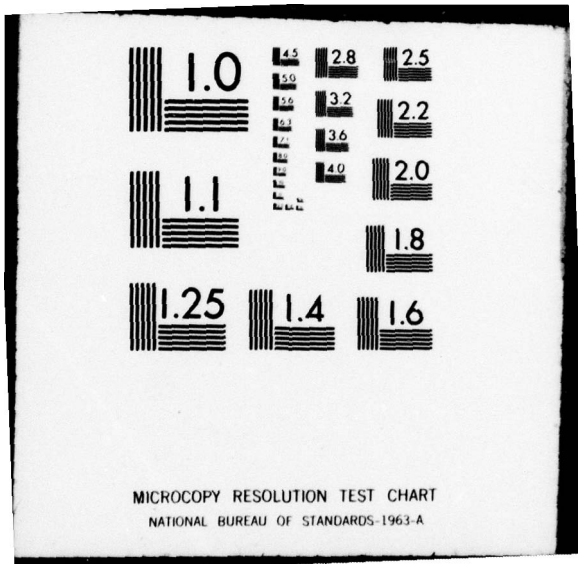
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Table 6: Nature and Relative Amounts of Cortex on Obsidian Debris

UNIT/LEVEL	COUNT (N)	%N w/CORTEX (C)	%C WATER-WORN	%C w/NATURAL CORTEX
N107/E102 -				
0-10	72	54.1%	100.0%	0%
10-20	107	48.5%	92.3%	7.7%
20-30	91	53.8%	89.8%	10.2%
30-40	157	38.8%	96.7%	3.3%
40-50	77	46.7%	100.0%	0%
50-60	71	42.2%	100.0%	0%
60-70	171	39.1%	98.5%	1.5%
70-80	49	42.8%	100.0%	0%
80-90	51	35.2%	100.0%	0%
90-100	28	35.7%	100.0%	0%
N111/E123 -				
0-10	194	34.5%	91.8%	8.2%
10-20	213	25.8%	100.0%	0%
20-30	458	25.5%	99.1%	0.9%
30-40	150	36.0%	98.1%	1.9%
40-50	209	73.0%	94.5%	5.5%
50-60	18	11.1%	100.0%	0%

With regard to the sources of lithic materials, it may also be noted that many of the basalt fragments recovered from the site were apparently derived from water-worn cobbles and pebbles and that the mortars and mortar fragments from the site were apparently manufactured from water-worn cobbles and boulders. In fact, all of the lithic materials noted to occur in the site are obtainable from the bed of the Napa River in the vicinity of the site.

Bone from the site was not especially common. As may be seen from an examination of Table 5 and Appendices 1 and 2, bone is far more common in the units in the northeastern portion of the site than elsewhere in the site and is at its highest frequency in the levels of those units between the 40 and 80 centimeter levels. Simons (Appendix 2) has pointed out the discrepancy between the observed bone at the Las Trancas site (Nap-14) as reported by Heizer (1953) and the identified vertebrate remains from Nap-261. Schulz's data (Appendix 1) lack comparable data from other sites in the area, although the relative paucity of fish bone on the whole and the absence of salmon and related species is perplexing, especially considering the fact that Nap-261 is perched immediately adjacent the Napa River, a stream which still enjoys an annual run of steelhead.

Shellfish remains from the site are primarily made up of fragments of the shells of *Mytilus edulis*. Occasional occurrences of *Ostrea*, probably *Ostrea lurida*, *Balanus spp.*, *Prototheca staminea*, *Tresus*, *Macoma* (probably *Macoma nasuta*). The rare, indeed unique, occurrences of *Olivella biplicata* and *Mytilus californianus* are probably more properly to be regarded as artifactual remains rather than constituent remains. In all cases, *Mytilus edulis* probably represents some 90% to 95% of the shell in the site. It must be considered, however, that the shell in the site was highly fragmented and fragile and it is likely that what was recovered in the course of the excavation was something less than 50% of what may have originally been in the soil of the site but fell through the screens or was crushed otherwise. Shellfish remains were found to be associated with some of the features in the site. This co-association will be discussed later in this chapter. The implications of the occurrence of shellfish in the site will be discussed at greater length in Chapter 5.

Micro-constituents

Micro-constituents of the site soil which have been recognized to date are confined to the poorly preserved palynomorphs discussed in Appendix 3. The soil of the site appears not to be condusive to the preservation of pollens. This is not surprising. The reader is requested to turn to Appendix 3 for the relevant discussion of the pollen studies and resulting interpretive possibilities.

Features

Probably the most common feature in the site is the typical ash lens so common to California middens. These features were found as small patches of diffuse ash or narrow lenses in the sidewalls of units. Ash lens features were common in all units at all depths, probably representing the remains of meal preparation. Lenses in unit N98/E102 were noted to contain shell and bone.

Located in unit N98/E102 is a large hearth or "cooking pit" (see Figure 5 and Plate 2b). The feature has been thoroughly disturbed by rodent activity but it may still be discerned as the remains of a pit which was excavated into the sub-midden soil and within which a fire was built and food roasted or otherwise cooked. The "ashy midden" illustrated in Figure 5 is laden with shell and animal bone.

Ash features also occur in association with what is interpreted to be a structure floor or "housefloor" (see Plate 7a) discovered in unit N100/E102 between the 30 and 50 centimeter levels. The hard-packed surface is heavily damaged by rodent activity but stands apart from the surrounding midden due to its very hard nature and associated ash lenses.

Inhumations from Nap-261 are represented in 3 features with a total of 4 individual burials apparently present. Only one of these features was exposed, Burial 1 in units N107/E88 and N106/E87½. All other remains were immediately covered with soil as soon as positive identification was made that the remains were human.

Figure 6, and Plate 8 illustrate the cache of artifacts associated with what may be an inhumation. A single fragment of what was identified to be human rib was found beneath the cache and was left undisturbed. The cache was made up of 4 complete pestles and an intact mortar. These artifacts are catalogued as numbers 77-14-210, 212, 213, 214, and 215. As may be noted in the illustration of the feature in Figure 6, immediately to the west of feature is a sheet of corregated sheetmetal at a depth of 39 centimeters. Disturbance of the site narrowly averted impacting the feature by less than 20 centimeters depth. Note the ash and rock feature at a depth of 97 centimeters in the unit. This ash feature is apparently not related to the apparent burial.

Unit N107/E98 contained the remains of what appeared to be an adult individual and an infant (see Figure 7). A pestle was found in association with the human remains (77-14-211). The remains were not exposed except to make positive identification.

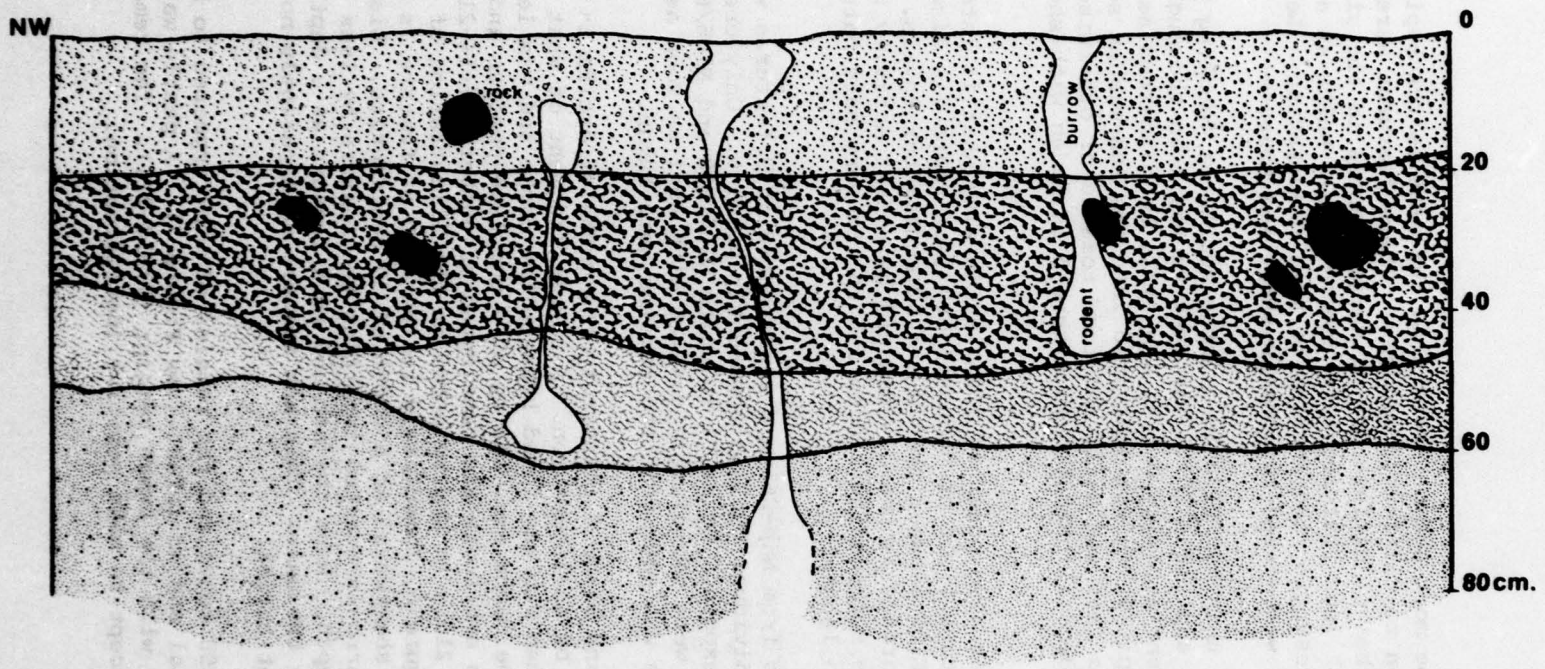


Figure 4:
"Typical" wall profile
N107/E92 – north sidewall

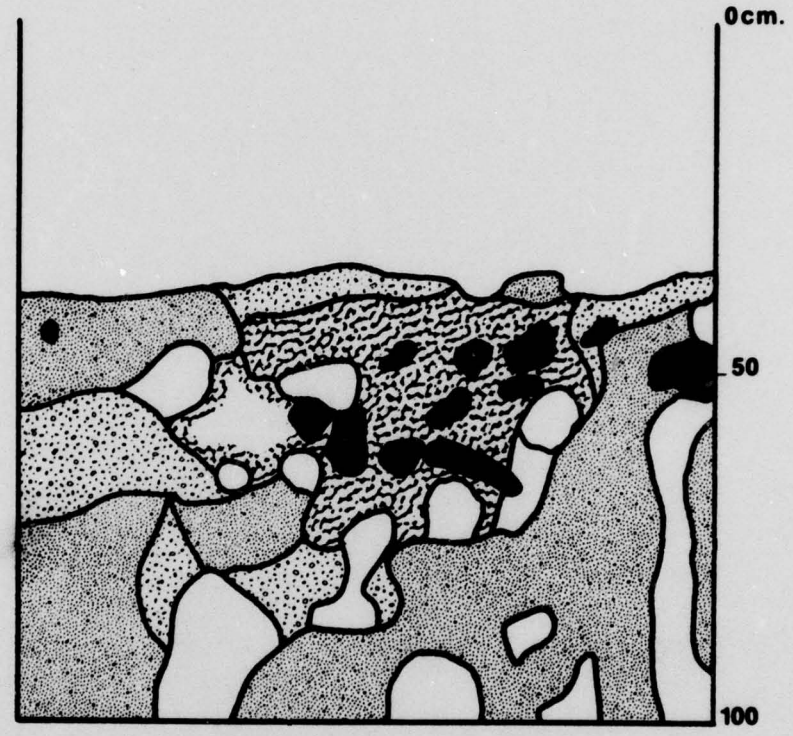
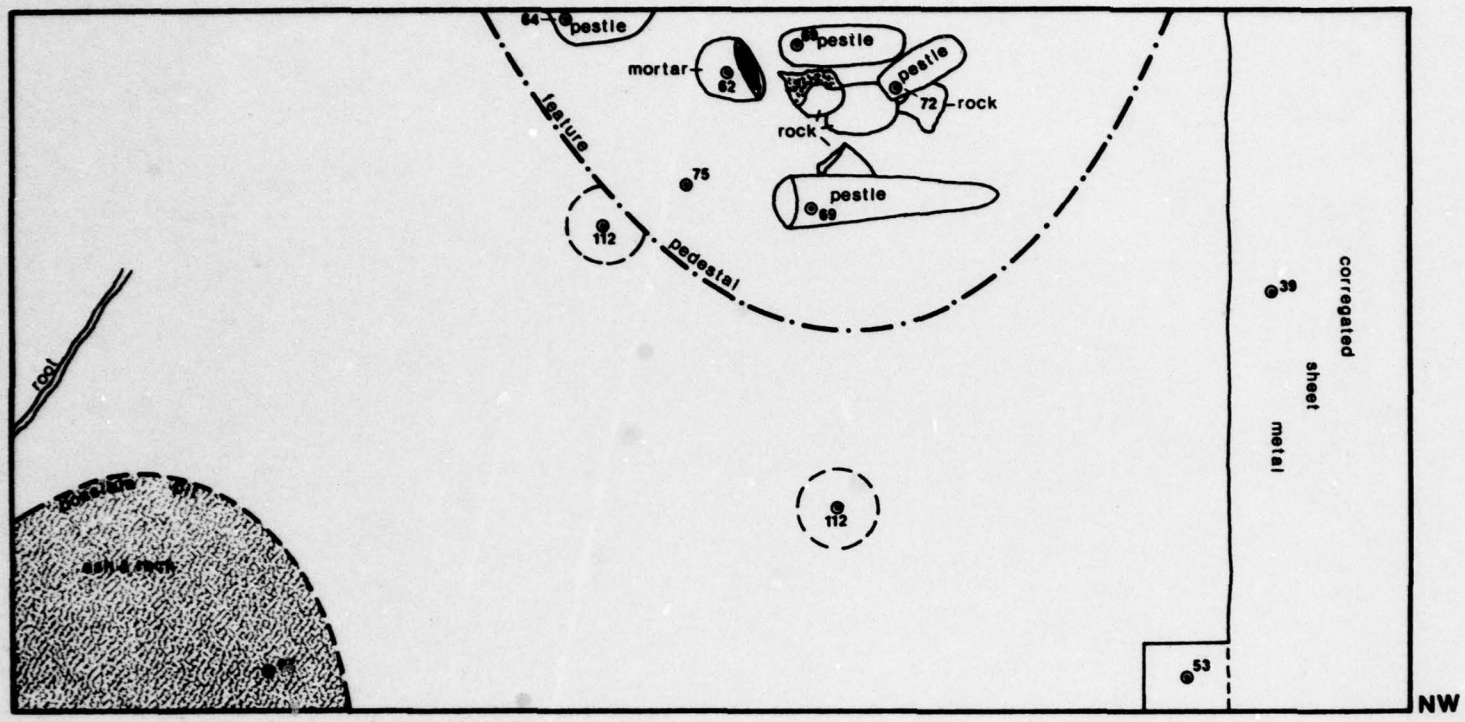
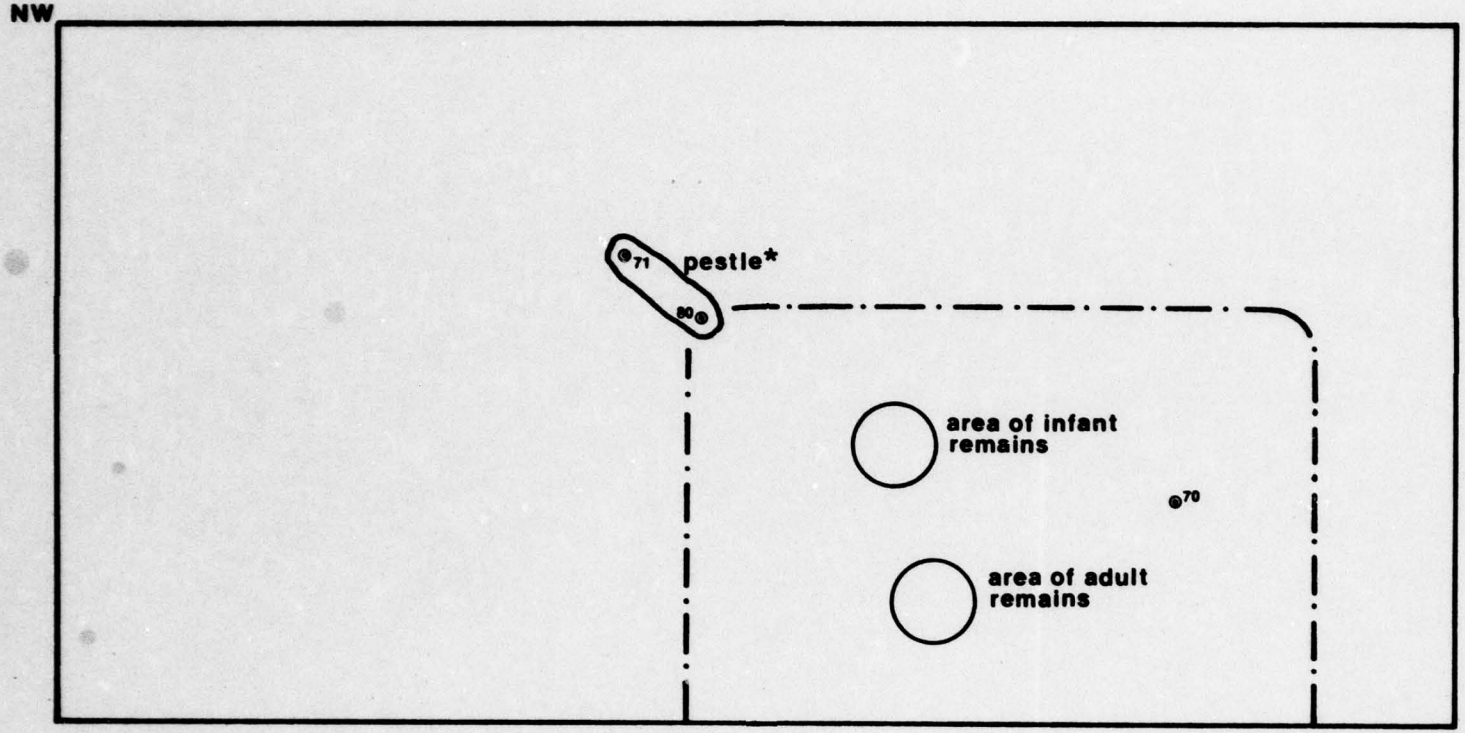


Figure 5:
N98/E102
North sidewall



0 10cm.

Figure 6
N107/E102
⊙ depth cms.



[*for illustration of pestle see Fig. 17]

0 10cm.

Figure 7
N107/E98
● depth cm.
—·— feature pedestal

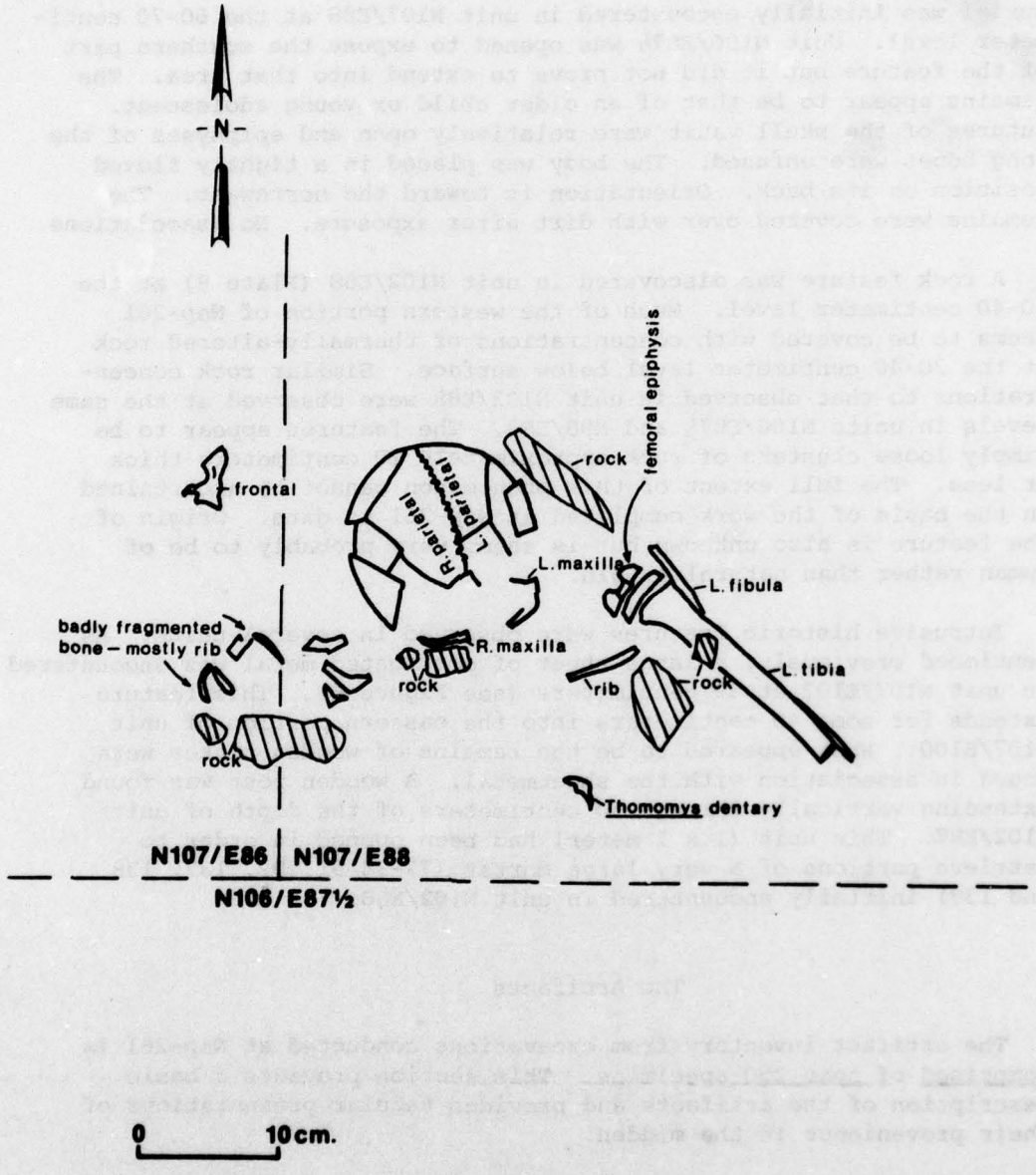


Figure 8
Burial 1

The only burial exposed in the course of excavations at Nap-261 is that referred to as 'Burial 1' (see Figure 8 and Plate 10). The burial was initially encountered in unit N107/E88 at the 60-70 centimeter level. Unit N106/E87½ was opened to expose the southern part of the feature but it did not prove to extend into that area. The remains appear to be that of an older child or young adolescent. Sutures of the skull vault were relatively open and epiphyses of the long bones were unfused. The body was placed in a tightly flexed position on its back. Orientation is toward the northwest. The remains were covered over with dirt after exposure. No associations.

A rock feature was discovered in unit N102/E88 (Plate 9) at the 30-40 centimeter level. Much of the western portion of Nap-261 seems to be covered with concentrations of thermally-altered rock at the 30-40 centimeter level below surface. Similar rock concentrations to that observed in unit N102/E88 were observed at the same levels in units N106/E87½ and N98/E88. The features appear to be simply loose clusters of rock approximately 10 centimeters thick or less. The full extent of this phenomenon cannot be ascertained on the basis of the work completed at Nap-261 to date. Origin of the feature is also unknown but is seems very probably to be of human rather than natural origin.

Intrusive historic features were observed in several units. As mentioned previously, a large sheet of corregated metal was encountered in unit N107/E102 at 39 centimeters (see Figure 6). This feature extends for some 40 centimeters into the eastern portion of unit N107/E100. What appeared to be the remains of wooden stakes were found in association with the sheetmetal. A wooden post was found extending vertically through 50 centimeters of the depth of unit N102/E87. This unit (1 x 1 meter) had been opened in order to retrieve portions of a very large mortar (77-14-91, 92, 137, 138 and 139) initially encountered in unit N102/E88.

The Artifacts

The artifact inventory from excavations conducted at Nap-261 is comprised of some 250 specimens. This section provides a basic description of the artifacts and provides tabular presentations of their provenience in the midden.

The reader is directed to Figures 9 through 21 which serve to illustrate representative artifacts recovered from the site. All artifacts are drawn at exact size (x1) with the obvious exception of Figures 16 and 21.

Beads

A total of 16 of what are generally termed 'beads' were recovered in the course of excavations at the River Glen site. All but two of the beads are manufactured from the shell of *Olivella biplicata*. One disc bead is of steatite and one faceted glass bead represent the exceptions. All beads from the site are illustrated as Figure 10.

Glass Bead

Specimen 77-14-127 is a faceted glass bead found in unit N107/E102 at the 10-20 centimeter level, that is, within the disturbed upper portions of the site midden. The bead is opaque monochrome black with a maximum diameter of 7.0 millimeters and a minimum diameter of 6.5 millimeters. Diameter of the perforation is 2.0 millimeters. The bead's facets are not ground; apparently produced from a mold.

Olivella Shell Beads

Table 7 provides the data regarding the distribution of shell beads from the site. Occurrences are listed by type according to the typology for such beads devised by Bennyhoff and Fredrickson (1967) and as communicated by Bennyhoff to Jackson in the course of discussions regarding the beads from the site (1977). An excellent discussion of the relationship between the Bennyhoff and Fredrickson typology and earlier typological schemes for beads from Central California such as that offered by Gifford (1947), Lillard, Heizer and Fenenga (1939), Bennyhoff and Heizer (1958) and Gerow with Force (1968) appears in Bickel's (1976) doctoral dissertation on the archaeology of sites CA-Ala-328 and CA-Ala-12.

As Bickel (1976:75) has pointed out, the basic unit of analysis for beads should be the clusters of beads which occur as lots in archaeological sites, particularly lots associated with graves. Disassociated beads cannot be classified with the same degree of certainty as beads which are coassociated in lots. Unfortunately, all of the beads from Nap-261 must be considered to be disassociated. Only unit N111/E123 produced beads in some reasonable proximity to one another, nevertheless, evidence cannot be forwarded to suggest that these beads are a part of a definable lot or some other culturally meaningful association.

Measurements for shell beads are given as length (reference to the dimension along the axis run aperture to spine), width (dimension perpendicular to length) and perforation diameter (given as the greatest diameter of the perforation).

Table 7:

Horizontal and Vertical Distribution of Beads

Unit / Depth (cm.)	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	-
20-30	-	-	-	-	-	-	-	-
30-40	-	-	-	-	-	-	-	-
40-50	-	-	-	-	-	-	-	-
50-60	-	-	-	-	-	-	-	s
60-70	s	-	-	-	-	-	-	
70-80		-	-	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit / Depth (cm.)	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	glass
20-30	-	-	-	-	-	-	steatite	-
30-40	-	-	-	-	-	-	-	-
40-50	-	-	-	-	-	-	-	-
50-60	-	-	-	-	C2	C2	G3a	-
60-70	s	-	-	-	-	-	-	C2?
70-80		?	s	s	s	-	C2	C2
80-90						-	-	
90-100						s	-	
100-110							s	s @ 112cm

(Unit N111/E123 produced 1 G3a @ 20-30 cm.; 1 F3a @ 30-40 cm.; 2 F2a @ 40-50 cm.; 1 F3b @ 40-50 cm.; 1 G2a @ 40-50 cm; and 1 G5 @ 40-50 cm. - A single "semi-ground" *Olivella* shell bead was recovered from the surface of the site; ? = unit not to sterile.)

77-14-40: Type G3a (ring); length = 8mm.; width = 6.9mm.; perforation diameter = 2.8mm. The relatively small diameter of the perforation makes it possible that this bead may well fall within the range of saucer beads (Type G). As is, the bead probably falls within the range of the 3c category of Heizer, Lillard and Fenenga (1939) and Bennyhoff and Heizer (1958) and within the range of the X3b1 type of Gifford (1947). The bead was recovered from unit N107/E100 at a depth of 50-60 centimeters.

77-14-67: Type C2 (split, drilled - not bevelled); length = 13.4mm.; width = 11.7mm.; perforation diameter = 2.7mm. Type C2 beads of the Bennyhoff and Fredrickson typology overlap parts of X1b, X2b and X3b1 types of Gifford (1947) and are included in type 3b1 of Bennyhoff and Heizer (1958). The bead was found in unit N107/E100 at the 70-80 centimeter level.

77-14-119: Type C2 (split, drilled - not bevelled); length = 15.4mm.; width cannot be determined since specimen is fragmentary; perforation diameter = approximately 2.3mm. Bead is from unit N107/E96 at the 50-60 centimeter level.

77-14-142: Probably Type C2 (split, drilled - not bevelled); no dimensions may be obtained. Provenience is: unit N107/E102 at 60-70 centimeters.

77-14-151: Type C2 (split, drilled - not bevelled); length = 14.0mm.; width = 10.8mm.; perforation diameter = 2.8mm. This artifact was discovered in unit N107/E102 at a depth of 75 centimeters.

77-14-178: Type G3a (ring); length = 8.0mm.; width = 7.7mm.; perforation diameter = 4.3mm. Bead was located at the 20-30 centimeter level of unit N111/E123.

77-14-188: Type F3a (square saddle); length = 7.0mm.; width = 6.9mm.; perforation diameter = 1.5mm. The F3a series of the Bennyhoff and Fredrickson typology would be included in the X3c type of Gifford (1947) and the 3b2 "modified saddle" type of Bennyhoff and Heizer (1958). This bead was recovered from the 30-40 centimeter level of unit N111/E123.

77-14-189: Type not within the available Bennyhoff and Fredrickson typological scheme. This bead would appear to be what Gibson (1976:138) has termed "rough disc" or "semi-ground" *Olivella* beads which he dates between A.D. 1800 to A.D. 1816 in his report, "A Study of Beads and Ornaments from the San Buenaventura Mission Site (Ven-87)". Length = 5.3mm.; width = 5.0mm.; perforation diameter = 1.1mm. The bead was discovered on the surface of the site. This bead type has not been previously reported from the Napa Valley region. It must be noted,

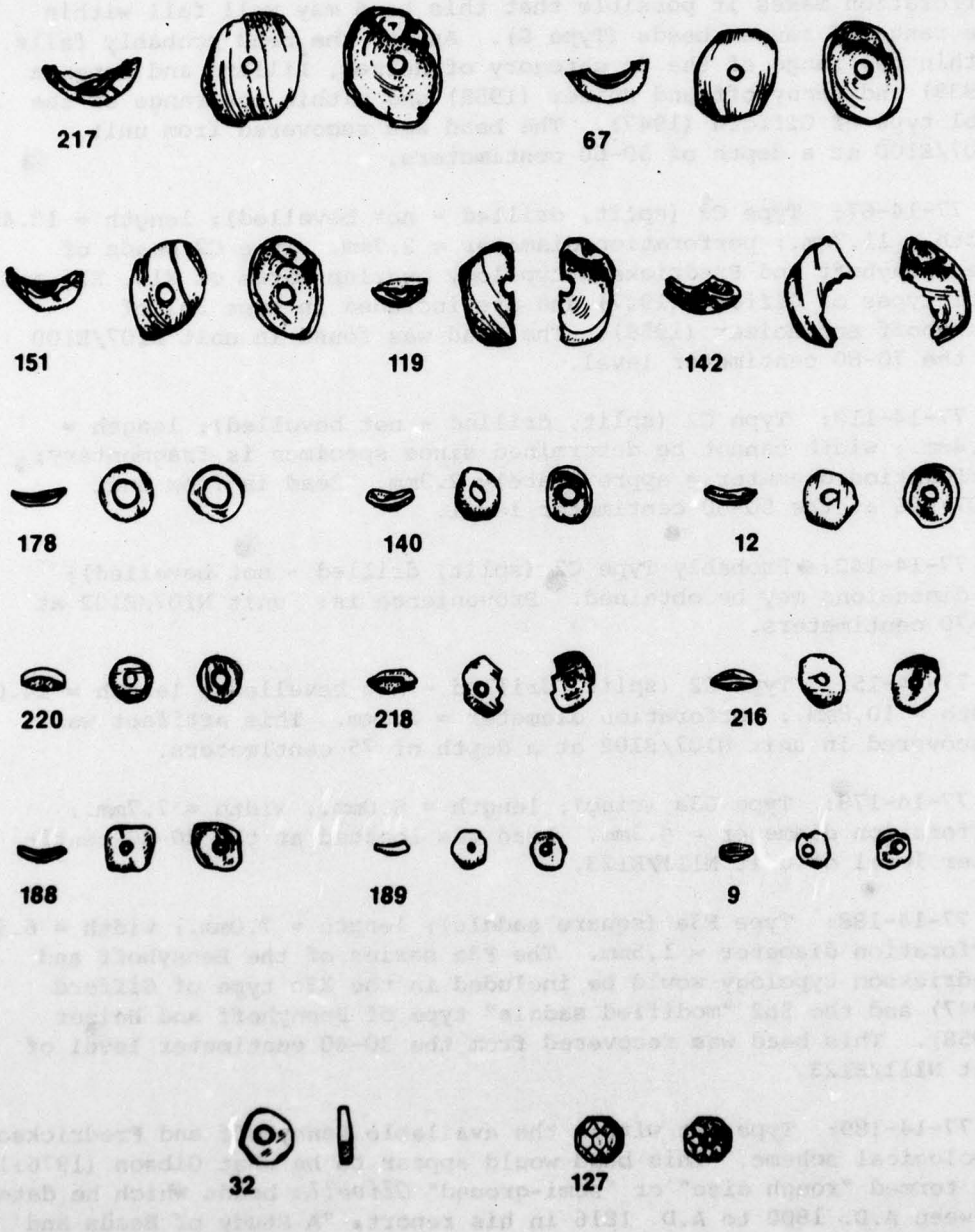


Figure 9

however, that as a single, unique and disassociated find, the bead may simply be an irregular form and not, in fact, represent a heretofore unknown bead type for the region.

77-14-216: Type F2a; assignment of this bead is somewhat problematic since it may be fragmentary (F2a = full saddle) and it lacks the degree of curve in the shell fraction which normally typifies full saddle beads; length = 6.8mm; width = 7.5mm; perforation diameter = 1.4mm. Artifact is from unit N111/E123 at a depth of 40-50 centimeters.

77-14-217: Type C2 (split, drilled - not bevelled); length = 6.3mm.; width = 3.5mm.; perforation diameter = 2.0mm - Unit N107/E98 at a depth of 50 centimeters.

77-14-218: Fragmentary but appears to be a full saddle (Type F2a). The full saddle type of Bennyhoff and Fredrickson would apparently correspond to the 3b classification of Bennyhoff and Heizer (1958) and the X3b1 and possibly X3c categories of the Gifford typology of 1947. Length measurement cannot be determined. Width is approximately 7.2mm. Perforation diameter is 1.9mm. This artifact was recovered from the 40-50 centimeter level of unit N111/E123.

77-14-219: Type G5 (oval saucer). Bennyhoff (personal communication to T. Jackson 1977) has suggested that this bead belongs within a new typological classification not a part of the current (i.e., 1967) Bennyhoff and Fredrickson typology, one which he would group as "G5, oval saucer". Bennyhoff reports that similar beads which would also comprise a part of the Bay Area population of oval saucer beads have been recovered from Ala-328. This bead may well represent a second *Olivella* bead type not previously reported from the Napa Valley area. Length = 8.9mm.; width = 7.9mm.; perforation diameter = 2.5mm. This type would probably have been incorporated into the X3c type of Gifford (1947) and the 3c type of Bennyhoff and Heizer (1958). The bead was found in unit N111/E123 in the 40-50 centimeter level.

77-14-220: Type G2a (small saucer); length = 6.5mm; width = 6.7mm.; perforation diameter = 1.9mm. This type would correspond to the 3c type of Lillard, Heizer and Fenenga (1939) and Bennyhoff and Heizer (1958). As with the previous two beads, this was found in unit N111/E123 at a depth of 40-50 centimeters.

77-14-221: Assignment of this bead is virtually impossible due to its fragmentary nature. The bead may be a fragment of a small square saddle (F3a) or it may simply be an anomalous form. Like the three beads just mentioned, this was found in unit N111/E123 at 40 to 50 centimeters depth.

Steatite Bead

A single irregular, possibly incomplete, steatite disc bead was recovered from unit N107/E100 at a depth of 20-30 centimeters. Maximum diameter of the bead is 8.3mm; thickness = 1.7mm; perforation diameter = 2.5mm.

Beads from the site are clearly the most useful instruments for purposes of cross-dating. The *Olivella* shell beads clearly place the components of the site below 40 centimeters in depth within the "Middle Horizon" of the Central California Taxonomic System or the "Houx Aspect" of the "Berkeley Pattern" as proposed by Fredrickson (1973; 1974). A more detailed discussion of the temporal implications of the beads from the site will follow in a subsequent chapter. It bears repeating, however, that the beads from the site are not parts of definable lots and are disassociated beads. As has been noted in the description of the individual beads, this must prompt some caution in the assignment of some beads to typological units.

Bone and Antler Tools

Bone and antler tools from Nap-261 are relatively few in number. Only one of the artifacts is a complete tool - all other remains being fragments of tools. The total inventory of bone and antler tools is 2 antler tine fragments and 17 bone tool items. Vertical and horizontal distribution of the tools from the site is tabulated and presented as Table 8.

Awls

Fragments of bone tools which evidence a high polish on their exterior surfaces and which frequently reveal striations in that surface apparently produced by use of the tool as a perforator are here subsumed under the general term "awl". This does not imply that these tools were employed in the manufacture of basketry or any other technologically-specific application. Those tools which we include under this categorization are artifact numbers 77-14-31, 38, 39, 98, 101, 102, 129, 186, 350, 352, 362 and 366. All are so fragmentary as to prevent assignment within any previously established typology of bone tools. Items 77-14-101 and 77-14-102 are illustrated as part of Figure 9. 77-14-102 is the only tip fragment which is replete with the 'tip' itself. Of the 6 fragments of bone tools which may be regarded as tool tips, it is the only flat bone splinter, the others being round or elliptical in cross section. All other fragments of tools in this group are medial fragments.

Eyed Awls or Needles

The title applied to this collection of 2 artifacts, one complete and one fragmentary tool, is borrowed from Gifford's (1940:174) type "P3a. Eyed awl or needle." Artifact 77-14-111 was recovered from the surface of the river bank some 20 meters east of the site. It is a well made tool measuring 87.7 millimeters in overall length, with a perforation diameter of 3.9 millimeters (see Figure 9).

A fragment of an eyed awl or needle was recovered from unit N106/E102 at a depth of 40-50 centimeters. It is a proximal end fragment which shows a distinct darkening of the bone about the area of the "eye" of the tool which is approximately 3.4 millimeters in diameter (see Figure 9; artifact number 77-14-222).

Table 8:

Horizontal and Vertical Distribution of Bone and Antler Tools and Tool Fragments

Unit	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	-
20-30	-	-	-	-	-	-	-	-
30-40	-	-	-	-	-	-	-	-
40-50	-	-	-	-	-	-	-	N
50-60	-	-	AT	-	-	-	-	s
60-70	s	-	-	-	-	-	-	
70-80		-	A	s	s	?	?	
80-90		-	SS/A					
90-100		s	s					
100-110								

Unit	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	A
20-30	-	-	-	-	-	-	A	-
30-40	-	-	-	-	A	A	-	-
40-50	-	SS	-	-	-	-	-	-
50-60	-	-	-	-	-	SS	A/A	-
60-70	s	-	-	A	-	A	-	-
70-80		?	s	s	s	-	-	-
80-90						-	-	-
90-100						s	s	-
100-110								s @ 112cm.

('s'= depth at culturally sterile soil; '?'= depth to sterile soil not ascertained; 'A'= "awl"; 'AT'= antler tine; 'N'= "needle"; 'SS'= "scapula saw; "awl" frags. recovered from Unit N111/E123, 1 at 20-30 cm. level and 1 at 40-50 cm. level, 1 antler tine @ 40-50 cm.)

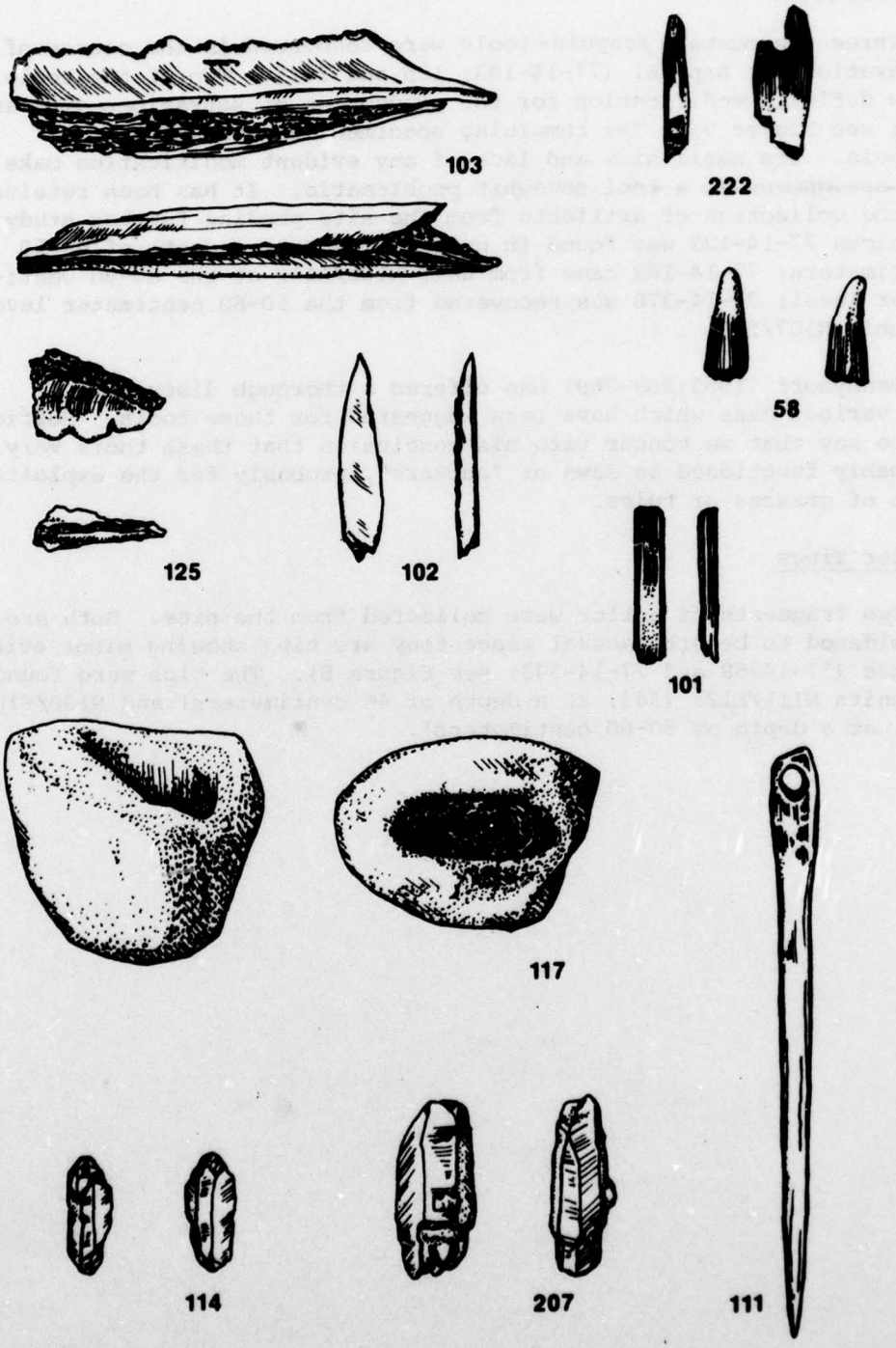


Figure 10

Scapula Saws

Three fragmentary scapulae tools were recovered in the course of excavations at Nap-261 (77-14-103, 125 and 367). Two of the tools show definite modification for the production of serrations (103 and 125; see Figure 9). The remaining specimen is a fragment of a scapula. Its small size and lack of any evident modification make its assignment as a tool somewhat problematic. It has been retained in the collection of artifacts from the site pending further study. Specimen 77-14-125 was found in unit N107/E88 at a depth of 40-50 centimeters; 77-14-103 came from unit N100/E102 at the 80-90 centimeter level; 77-14-376 was recovered from the 50-60 centimeter level of unit N107/E98.

Bennyhoff (1953:268-269) has offered a thorough discussion of the various uses which have been suggested for these tools. Suffice it to say that we concur with his conclusion that these tools very probably functioned as saws or "cutters", probably for the exploitation of grasses or tules.

Antler Tines

Two fragments of antler were collected from the site. Both are considered to be artifactual since they are tips showing minor evidence of use (77-14-58 and 77-14-343; see Figure 9). The tips were found in units N111/E123 (343, at a depth of 46 centimeters) and N100/E102 (58, at a depth of 50-60 centimeters).

Flaked Stone Tools

The artifact inventory of this category of items from Nap-261 is the single largest collection. Included are all stone tools which have been manufactured by removing flakes from previously unformed stone or by altering previously formed tools in order to create a desired tool. For the most part, flaked stone tools from the site comprise a rather unimpressive lot. However, these tools provide a definite clue as to the nature of the economy of the prehistoric peoples who occupied the site.

Bangle

Artifact 77-14-170 (see Figure 11) is the singular example of what may be called a bangle (cf. Riddell, *et al* 1953:264). The object is a six-sided, naturally formed obsidian object recovered from unit N107/E94 at a depth of 20-30 centimeters. The specimen is broken, but otherwise unmodified. Elsewhere, these objects have been termed "prisms" (cf. Moratto 1972). These formations have been observed by the principal author of this report (Jackson) at the Glass Mountain obsidian source near St. Helena.

Bifaces (knives or projectile points)

This general sub-category of tools includes those artifacts from the site as follows: (77-14-) 1, 2, 8, 14, 21, 30, 36, 37, 44, 47, 50, 77, 84, 85, 86, 99, 105, 106, 107, 109, 110, 112, 115, 118, 121, 123, 126, 134, 141, 162, 164, 166, 167, 168, 172, 174, 175, 182, 183, 184, 185, 187, 194, 202, 205, 206, 351, 353 and 368. All but 1 are fragmentary remains. The single exception is a very finely made bi-point, artifact number 77-14-141, found in unit N107/E102 at the 60-70 centimeter level (see Figure 13 for illustration of this specimen and other representative examples of this group from the site).

No attempt will be made to describe each individual artifact in this sub-category. For the most part, the remains are too small and lacking in landmarks to prove worthy of note. Features of interest on certain artifacts will be discussed, otherwise it will suffice to note whether the fragment is a tip, or from the medial portion of the tool or from the basal portion of the tool.

The determination as to whether an individual fragment is part of a projectile point or part of a knife (or similar cutting tool) is largely problematic. It is the our opinion that the vast majority of the artifacts are portions of cutting tools, that is, knives, as opposed to projectile points. However, artifact number 77-14-184 (see Figure 13) is quite obviously a small arrow point. Bi-point

77-14-141 is also considered to be a projectile point. A preponderance of knives seems to be a characteristic of "Middle Horizon" components of North Bay sites studied by the author. The sites of the Napa Valley region, at least on the basis of Heizer (1953) and observations of the collections from the area in the Lowie Museum of Anthropology, do not refute this observation. At Mrn-170, this was seen as evidence of a well-developed fishing industry (Henn and Jackson, n.d.; cf. Chavez 1975). Although bi-points from this site are not as numerous as in other sites from the North Bay, they still comprise the single largest artifact 'type' from the site. While we would persist in our interpretation that these are suggestive of an active fishing industry, we must take into consideration the relative paucity of fish remains from the midden, especially the remains of those fish species which would seem to have been major food sources. This point will be discussed more fully in the section of this report which deals with the interpretation of the remains from the site.

Table 9 provides a tabulation of the horizontal and vertical distribution of biface tools (knives/proj. pts.); all are of obsidian.

77-14-1	tip	very water-worn
77-14-2	tip	very water-worn
77-14-8	medial	both fractures appear to be 'snap breaks'
77-14-14	tip	'ribbon' flakes up to 9.5mm create edge
77-14-21	medial	'snap' and poss. impact fractures present
77-14-30	tip	very small fragment
77-14-36	medial	impact burin facets present
77-14-37	medial	burin faceted, probably by impact
77-14-44	medial	'snap' breaks; light serration, approx. 5 per cm.
77-14-47	medial	
77-14-50	basal	burin faceted, probably intentionally (Fig. 13)
77-14-77	medial	
77-14-84	basal(?)	curvate biface, 1 straight & 1 excurvate edge
77-14-85	basal	rough workmanship
77-14-86	tip	fragment of large heavy knife or spear tip
77-14-99	basal	burin faceted, prob. intentional; prob. knife fragment; see Figure 13
77-14-105	tip	
77-14-106	medial	heavy tool; 'snap' & impact fractures
77-14-107	tip	impact fracture
77-14-109	-	prob. complete 'pre-form'; water-worn
77-14-110	tip	burin faceted, probably intentionally (Fig. 13)
77-14-112	?	fragment retouched, possibly along an impact burin facet; 'snap' break also present
77-14-115	tip(?)	'snap' break
77-14-118	tip	impact burin facet & 'snap' break
77-14-121	medial	impact fractures & 'snap' break
77-14-123	tip	possible impact fractures

77-14-126	medial	heavy, roughly worked tool fragment
77-14-134	medial	
77-14-141	complete	length = 64.1mm; width = 25.5mm; thickness = 6.8mm (max.); weight = 9.5 grams
77-14-162	basal(?)	very small fragment
77-14-164	medial	fragment of large tool
77-14-165	tip	fragment of well made tool
77-14-166	medial	roughly made; poss. from incompl. tool
77-14-167	basal	
77-14-168	medial	fragment of heavy cutting(?) tool
77-14-172	medial	fragment of roughly made tool; poss. incompl.
77-14-174	medial	'snap' breaks; large tool
77-14-175	basal	'snap' break, possibly at hafting line
77-14-182	basal	'snap' break, possibly at hafting line
77-14-183	basal	'snap' break
77-14-184		largely complete arrow point (see Figure 13); corner-notched, expanding stem; max. blade width = 11.0mm; min. hafting (neck) width = 6.2mm; max. hafting width = 7.1mm; est. weight if complete = 1.2 to 1.3 grams. From unit N111/E123 at 20-30cms. depth.
77-14-185		spall from edge of biface; possibly an intentionally removed burin spall
77-14-187		fragment of very large, roughly worked biface (see Figure 12); 'snap' break
77-14-194	basal	'snap' break
77-14-202	basal	roughly worked; poss. broken in manufacture
77-14-205	tip	tip of well worked biface (see Fligure 13); 'snap' break
77-14-206		(see Figure 12) roughly worked biface; poss. 'preform'
77-14-351	basal	impact fractures
77-14-353	basal	break possibly along hafting line
77-14-368	tip	tip of well made biface; lightly serrated, 5 to 6 serrations per cm.

In our discussion of the macro-constituents from the midden, we considered the relative percentages of obsidian material which evidenced either natural or water-worn cortex. Of the 49 items in this sub-category, 4 were water-worn after manufacture, 5 retain evidence of natural cortex, 1 was made from a water-worn pebble as evidenced by vestiges of cortex and the remainder (39) bear no indication of any cortex whatsoever.

Table 9:

Horizontal and Vertical Distribution of Bifaces
(knives or projectile points)

Unit / Depth (cm.)	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
0-10	1	1	1	-	-	-	-	-
10-20	-	-	-	-	-	-	1	-
20-30	-	-	1	-	2	-	-	-
30-40	-	1	1	-	-	-	-	-
40-50	-	-	-	-	-	-	-	-
50-60	1	-	*	-	-	-	-	?
60-70	s	-	*	-	-	2	-	
70-80		-	1	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit / Depth (cm.)	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
0-10	-	1	-	1	1	-	-	-
10-20	-	-	-	3	-	1	-	-
20-30	-	-	-	1	-	-	1	-
30-40	-	3	-	-	-	3	1	-
40-50	-	-	-	-	-	-	-	-
50-60	-	-	-	-	-	-	1	-
60-70	s	-	-	-	-	-	-	-
70-80	?	s	s	s	-	-	-	-
80-90						-	-	-
90-100						s	-	-
100-110							s	s @ 112cm.

(* = 3 biface tool fragments were recovered from this unit between 50 and 70 cms. in depth; biface fragments were found in unit N111/E123 as follows: 2 @ 0-10cms.; 4 @ 20-30cms.; 1 @ 30-40cms.; 2 @ 40-50cms.; and 1 was found at a depth between 48 and 55cms.)

Burin

A single example of what may be a burin was discovered in the course of excavations at the River Glen site. A water-worn obsidian pebble has been broken to produce a heavy plano-convex flake which retains cortex over some 30% of the convex surface. The tool has been roughly formed by the removal of flakes by percussion to form a pointed tool. The tip of the artifact has been further prepared by the removal of a thin elongate flake, probably by the application of a burin blow. This flake was removed from the planar side of the artifact. Some evidence of wear is present on the beak of the tool. A portion of the tool at the opposite end from the beak has apparently been employed as a scraper or in a similar function as it shows unifacial wear. Artifact 77-14-120 - unit N102/E88 - depth = 20-30cms.

Cores/Core Tools

Within this category of tools we recognize a number of sub-groups, specifically, cores, core remnants and choppers. Cores are those initially unmodified pieces of rock from which flakes have been removed and which, in turn, are then fashioned into tools. None of the cores from the site are "prepared" in the traditional sense of that term as applied in archaeology. Core remnants are either portions of cores which have apparently resulted with the fragmentation of a core or are the remains of cores which have been worked to the point that the removal of flakes is either not possible or not practical. The single possible chopper from the site is a large pebble of milky quartz, water-worn, from which a number of large percussion flakes have been struck, apparently with the intent to form a working edge. The tool was recovered from unit N100/E102 at the 20-30 centimeter level; it will not be discussed further except to mention the weight which is 183.4 grams. Cores are differentiated from choppers in that cores do not evidence wear on the edges produced with the removal of flakes from the body of the core. The chopper is number 77-14-49.

Cores and core remnants from the site number 3 of chert, 11 of basalt and 17 of obsidian. All of the obsidian tools are made from stream-worn pebbles with one exception, that is, all but one specimen exhibit cortex produced by erosion in a stream environment. The exception has had all surfaces which might have exhibited cortex removed. Artifacts considered to be cores or core remnants are numbers (77-14-) 34, 54, 55, 89, 146, 147, 148, 149, 150, 179 and 191, made of basalt, 7, 68 and 108, made of chert, and 15, 18, 26, 28, 33, 51, 53, 62, 63, 78, 136, 161, 180, 181, 193, 197 and 369 which are made of obsidian. Three of the basalt cores are apparently made from water-worn pebbles or cobbles. None of the chert appears to have been stream eroded.

Distribution of cores and core tools is presented as Table 10.

Table 10:

Horizontal and Vertical Distribution of Cores and Core Tools

Unit / Depth (cm.)	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
0-10	-	-	-	-	-	-	-	-
10-20	-	-	cC	-	-	-	-	-
20-30	oC	-	qCH	-	-	-	-	-
30-40	-	-	2bC/2oCR	-	-	-	-	oCR
40-50	oCR	-	-	-	-	-	-	-
50-60	-	-	-	oC	-	-	-	?
60-70	s	-	-	-	oCR	-	-	
70-80		-	-	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit / Depth (cm.)	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	oCR	-	oC/oCR	-
20-30	-	-	bC	-	-	oC	-	-
30-40	-	cC	-	-	-	-	bC/oC	-
40-50	oC	-	-	-	-	-	-	-
50-60	-	-	-	-	-	-	oCR	5bCR
60-70	s	-	-	-	-	-	-	-
70-80		?	s	s	s	-	cCR	-
80-90						-	-	-
90-100						s	-	-
100-110							s	s @ 112cm.

('b'=basalt; 'c'=chert; 'o'=obsidian; 'q'=quartz; 'C'=core; 'CH'= chopper; 'CR'=core remnant; 's'=depth to sterile soil; '?'=depth to sterile not ascertained; Unit N111/E123 produced 1 basalt core, 1 obsidian core and 1 obsidian core remnant at the 20-30 cm. level; also recovered were 1 basalt chopper and 1 obsidian core remnant from the 30-40 cm. level in the unit.)

Bifaces (other)

Artifacts which have been bi-facially prepared but which do not fall into other artifact categories are represented by two artifacts from the site, 77-14-48 and 77-14-124. Both are made of obsidian.

77-14-48 is a fragment of a biface which has been retouched. The artifact may have been a projectile point or knife which was broken at the tip and then reworked in order to see further use. What makes the object somewhat problematic is that we have no way of discerning if the reworking of the tip was done before or after the final break which leaves us with this tool fragment. A small spall flake has been removed from the very tip of the reworked portion of the tool, perhaps suggesting that a projectile point was reworked and then broken for a second time. On the other hand, the broken tip of the original tool may have been employed to make the artifact which we have recovered and this tip was, in turn, employed as some sort of perforator. Evidence of use or wear does not provide a convincing argument for either interpretation. The item was found in unit N100/E102 at a depth of 10-20 centimeters (see Figure 13).

A second problematic tool in the sub-category of biface tools is a plano-convex tool apparently fashioned from a water-worn obsidian pebble (some cortex remaining). 77-14-124 is triangular in cross section and worked to form a point, likewise triangular in cross section. What may have been a proximal end of the tool is not present, adding to the difficulty of classification and determination of function. No conspicuous wear is evident on the artifact except along the lower planar edge of the tool, suggesting its use as a scraping tool. Wear appears unidirectional away from the planar surface. Provenience: unit N107/E102 at 0-10 centimeters depth.

Scrapers

Scrapers are flake tools presumably employed in a number of functions which included scraping various sorts of materials, including hides and wood. Scrapers may or may not exhibit modification beyond simple wear. Some have been, however, conspicuously retouched to sharpen or otherwise maintain the working edge. Working edges may be concave, straight or convex. Edge wear is invariably unidirectional. Indication of size will be noted by the recording of the weight of complete specimens. Figure 12 illustrates some representative examples of this tool group. Table 11 provides provenience for scrapers from Nap-261.

Concave edge scrapers include artifact numbers (77-14-)5, 10, 11, 13, 20, 26, 35, 152, 169, 348, 356, 359, 365. All are of obsidian. Seven of the tools retain water-worn cortex, 1 retains some natural cortex and 4 retain no cortex.

Table 11:

Horizontal and Vertical Distribution of Scrapers

Unit	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
Depth (cm.)								
0-10	1	-	2	-	-	-	1	-
10-20	3	-	1	-	-	-	-	1
20-30	1	-	-	-	-	-	-	1
30-40	-	-	1	-	-	-	-	3
40-50	1	-	-	-	-	-	-	2
50-60	-	-	1	-	1	-	-	?
60-70	s	-	-	-	-	-	-	
70-80		2	-	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
Depth (cm.)								
0-10	-	1	-	-	-	-	-	-
10-20	-	1	2	1	-	-	2	-
20-30	-	-	-	-	2	1	-	-
30-40	-	1	-	1	-	2	1	-
40-50	1	-	-	-	-	-	-	-
50-60	1	-	-	-	-	-	-	2
60-70	s	-	-	-	-	2	-	-
70-80		?	s	s	s	-	-	-
80-90						-	-	1
90-100						s	-	1
100-110							1 @ s	s @ 112cm.

(Scrapers were recovered from unit N111/E123 at depths as follows:
2 at 40-50 centimeters; 3 at 50-60 centimeters.)

Straight edge scrapers include artifact numbers (77-14-)6, 9, 12, 16, 27, 43, 52, 57, 59, 65, 66, 75, 76, 94, 95, 104, 143, 157 (made concave by use and deterioration of thin edge of flake), 163, 195, 199, 200, 201, 208, 209, 349 (evidences use of straight edge as well as naturally occurring concave edge surface), 354 (only tool to show bifacial wear), 355 (edge deteriorated by use), and 363. All but 1 (200) are of obsidian; the exception is of basalt. The basalt tool is struk from a water-worn cobble or pebble. Of the obsidian tools 11 have retained evidence of water-worn cortex, 4 show natural cortex and 13 exhibit no cortex. Of the straight edge scrapers, all but 9 evidence very heavy use or retouch on steep edges (greater than 30 degrees, cf. Semenov 1964) and it may be suggested that these were employed in the working of wood as opposed to skins or other soft material. The remaining 9 evidence rather light wear indications.

Convex edge scrapers include artifact numbers (77-14-)144, 153, 158, 160, 190, 347, 357, 360 and 361. All but 77-14-158 are of obsidian, the exception being of what appears to be chert. Edges of these tools, that is, the working edge, is convex and generally conspicuously blunted by use. Use wear is unidirectional, of course.

Table 12 provides the weight of the artifacts in each scraper category.

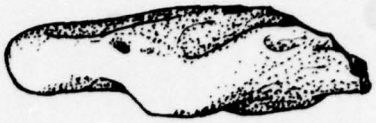
Table 12:

Weights of Scrapers

Type	Catalogue #	Weight (grs.)
concave edge	77-14-5	5.4
" "	77-14-10	2.9
" "	77-14-11	1.7
" "	77-14-13	1.3
" "	77-14-20	1.1
" "	77-14-26	7.3
" "	77-14-35	4.0
" "	77-14-152	6.4
" "	77-14-169	5.9
" "	77-14-348	3.2
" "	77-14-356	2.7
" "	77-14-359	3.3
" "	77-14-365	6.5
straight edge	77-14-6	1.8
"	77-14-9	1.8
"	77-14-12	0.8
"	77-14-16	1.6
"	77-14-27	1.9
"	77-14-43	2.1

Table 12 (cont.):

Type	Catalogue #	Weight (grs.)
straight edge	77-14-52	3.1
" "	77-14-57	1.9
" "	77-14-59	3.7
" "	77-14-65	3.6
" "	77-14-66	1.8
" "	77-14-75	8.1
" "	77-14-76	3.3
" "	77-14-94	4.5
" "	77-14-95	4.0
" "	77-14-104	1.6
" "	77-14-143	9.8
" "	77-14-157	2.8
" "	77-14-163	11.0
" "	77-14-195	1.4
" "	77-14-199	4.9
" "	77-14-200	19.2
" "	77-14-201	0.7
" "	77-14-208	1.7
" "	77-14-209	19.5
" "	77-14-349	3.7
" "	77-14-354	10.6
" "	77-14-355	2.2
" "	77-14-363	1.8
convex edge	77-14-144	2.5
" "	77-14-153	4.4
" "	77-14-158	40.5
" "	77-14-160	1.0
" "	77-14-190	5.4
" "	77-14-347	9.6
" "	77-14-357	1.8
" "	77-14-360	2.1
" "	77-14-361	4.2



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161

Figure 11

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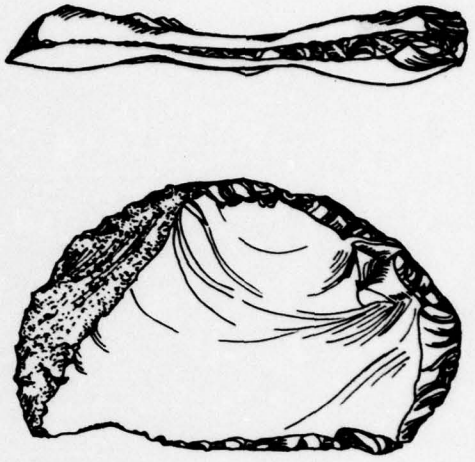

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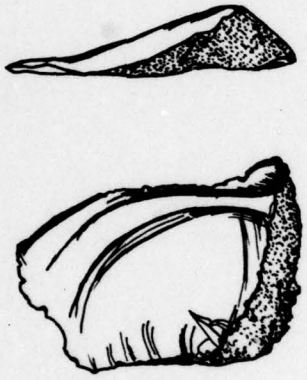

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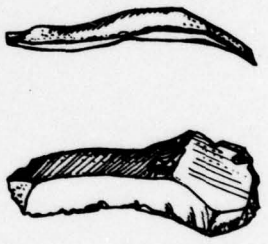

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Figure 12

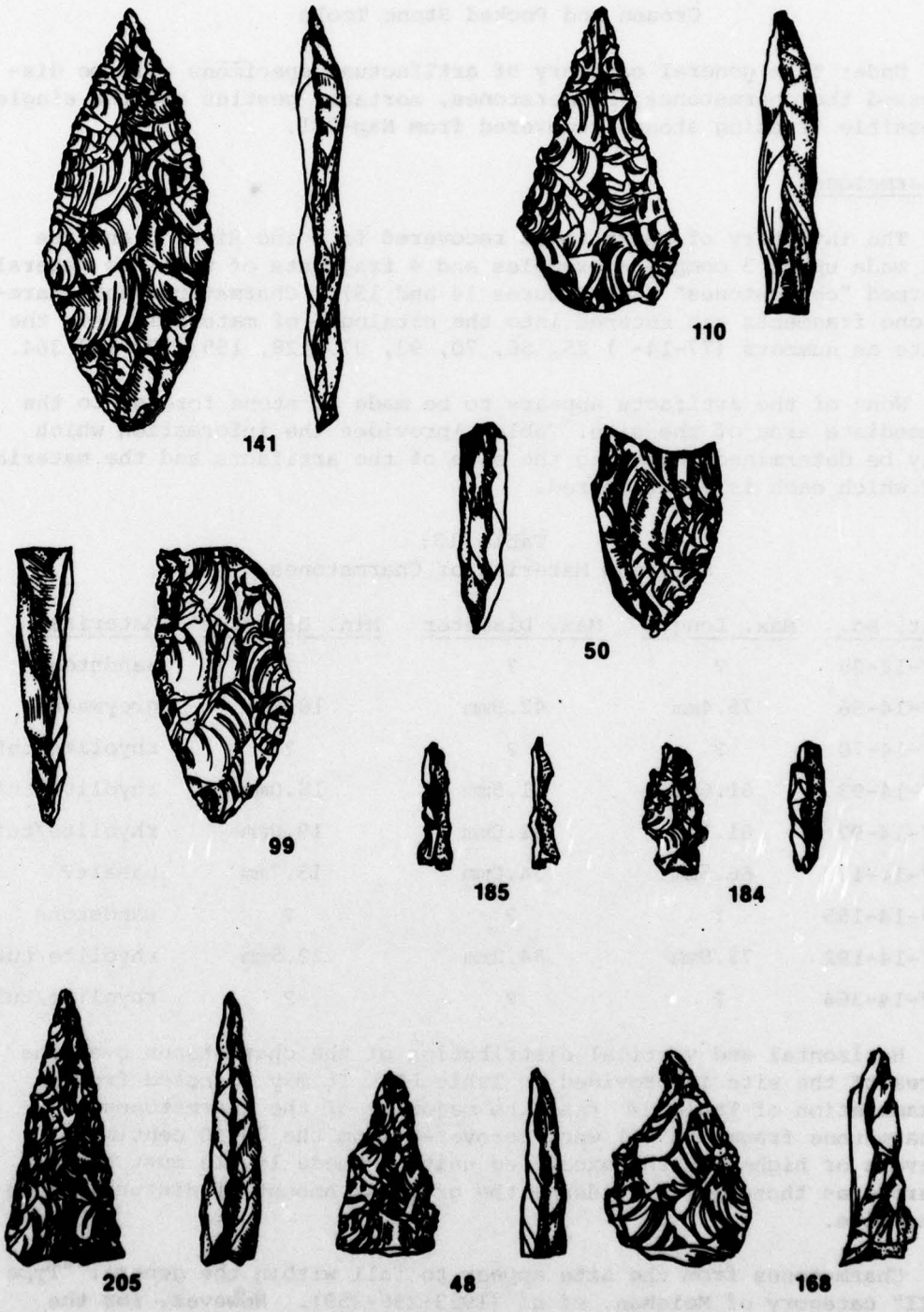


Figure 13

Ground and Pecked Stone Tools

Under this general category of artifactual specimens will be discussed the charmstones, hammerstones, mortars, pestles and the single possible "rubbing stone" recovered from Nap-261.

Charmstones

The inventory of charmstones recovered from the River Glen site is made up of 5 complete examples and 4 fragments of what are generally termed "charmstones" (see Figures 14 and 15). Charmstones and charmstone fragments are entered into the catalogue of materials from the site as numbers (77-14-) 25, 56, 70, 93, 97, 128, 155, 192 and 364.

None of the artifacts appears to be made of stone foreign to the immediate area of the site. Table 13provides the information which may be determined regarding the size of the artifacts and the material of which each is manufactured.

Table 13:
Size and Material of Charmstones

Cat. No.	Max. Length	Max. Diameter	Min. Diameter	Material
77-14-25	?	?	?	sandstone
77-14-56	75.4mm	42.9mm	18.0mm	greywacke
77-14-70	?	?	?	rhyolite/tuff
77-14-93	61.6mm	31.5mm	18.0mm	rhyolite/tuff
77-14-97	61.1mm	31.0mm	19.8mm	rhyolite/tuff?
77-14-128	66.5mm	34.0mm	15.7mm	basalt?
77-14-155	?	?	?	sandstone
77-14-192	73.8mm	34.2mm	22.5mm	rhyolite/tuff
77-14-364	?	?	?	rhyolite/tuff

Horizontal and vertical distribution of the charmstones over the area of the site is provided in Table 14. It may be noted from an examination of Table 14 that the majority of the charmstones or charmstone fragments (5) were recovered from the 30-40 centimeter levels or higher in the excavated units. These levels must be regarded as those which evidence the greatest amount of disturbance in the site.

Charmstones from the site appear to fall within the general "Type III" category of Meighan, *et al* (1953:258-259). However, for the most part, these artifacts are somewhat dissimilar. For example,

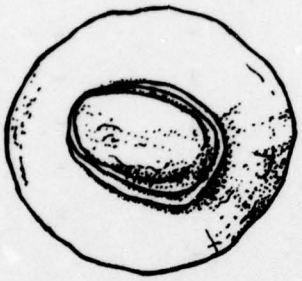
Table 14:

Horizontal and Vertical Distribution of Charmstones

Unit	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	-
20-30	-	-	-	-	-	-	-	-
30-40	-	-	-	-	-	-	-	-
40-50	-	-	1	-	-	-	-	-
50-60	-	-	1	-	-	-	-	s
60-70	s	-	-	-	-	-	-	
70-80		-	-	s	s	?	?	
80-90		-	-					
90-100		s	1(s)					
100-110								

Unit	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
Depth (cm.)								
0-10	-	-	-	-	-	-	1	-
10-20	-	-	-	-	-	-	-	1
20-30	-	-	-	-	1	-	-	-
30-40	-	-	-	-	1	-	-	-
40-50	-	-	-	-	-	-	-	-
50-60	-	-	-	-	-	-	-	-
60-70	s	-	-	-	-	-	-	-
70-80		?	s	s	s	-	-	-
80-90						-	-	-
90-100						s	-	-
100-110							s	s @ 112cm

(1 complete and 1 charmstone fragment were recovered from Unit N111/E123 at the 30-40 cm. and 40-50 cm. levels respectively.)



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192

Figure 14

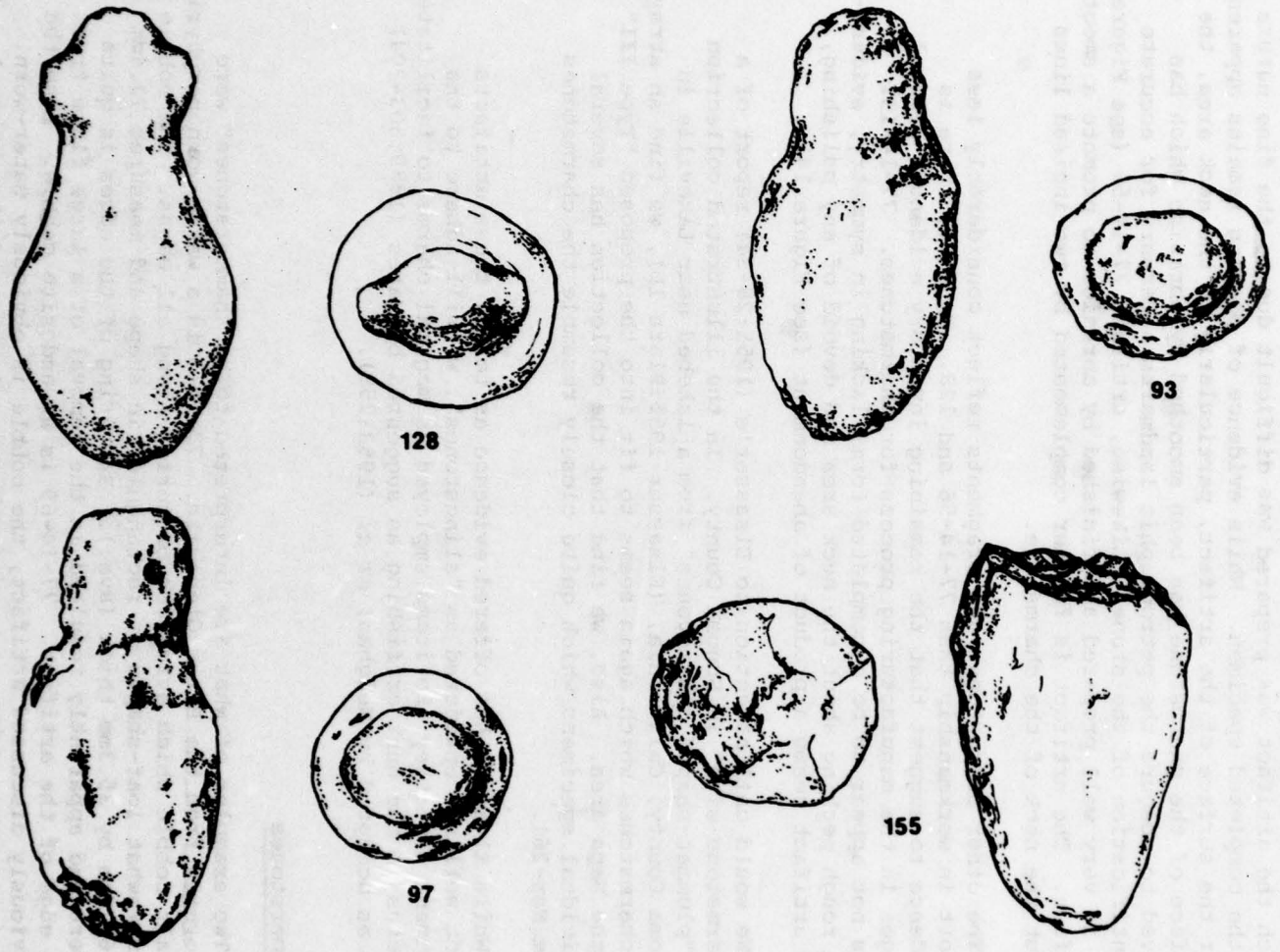


Figure 15

77-14-128 (see Figure 15) appears to be a unique form not heretofore reported for the Napa region. Identification of the material from which the artifact was prepared was difficult due to the fine nature of the completed specimen. While evidence of pecking remains apparent over the surface of the artifact, particularly in the neck area, the surface of the charmstone has been smoothed by abrasion which has served to obscure the petrographic landmarks necessary for accurate identification of the stone. Likewise, artifact 77-14-56 (see Figure 14) is very well prepared and finished by abrasion to promote a smooth surface. The artifact is further complemented by two incised lines about the neck of the charmstone.

The other charmstones and fragments reflect considerably less effort in workmanship than 77-14-56 and 128. In fact, there is evidence to suggest that the remaining inventory evidences several stages in the manufacturing process for charmstones. 77-14-192 does not appear to be a completed form; lacking in symmetry, evidencing rough pecking about the neck area and devoid of any polishing, the artifact seems a product of abandonment (see Figure 14).

We would call attention to Elsasser's (1955:29-34) report of a "charmstone site" in Sonoma County. In the illustrated collection of "plummet-shaped charmstones" from a lakebed near Lakeville in Sonoma County, California, (Elsasser 1955:Plate 1b), we find an array of charmstones which again seems to fit into the proposed "Type III" of the Napa area. Also, we find that the collection has several individual specimens which quite closely resemble the charmstones from Nap-261.

While Elsasser has offered evidence as to why these artifacts might well be considered as "slingstones", we will adhere to the argument that they are items employed as magical charms to facilitate success in the hunt or fishing as suggested by Yates (1889:303-304) and as accepted by Meighan, *et al* (1953:258).

Hammerstones

Two examples of what are interpreted to be "hammerstones" were recovered from the River Glen site. 77-14-3 is a water-worn porphyritic basalt cobble which evidences battering along all edges. The cobble is somewhat loaf-shaped or rectangular in shape and measures 72.4mm by 67.4mm by 35.3mm thick (ave.). Battering of the edges is quite severe and apparently resulted in the removal of a large flake from one edge of the artifact. 77-14-69 is an andesite cobble. Like the previously discussed artifact, the cobble is obviously water-worn. The specimen is fragmentary and the general shape of the original complete tool cannot be ascertained with certainty. Battering of

the remaining working edge of the tool is less severe than that noted on 77-14-3, the tool apparently having seen light use. The artifacts were recovered from units N102/E88 at 20-30 centimeters (77-14-3) and N107/E100 at 80-90 centimeters (77-14-69).

Mortars

Mortars and mortar fragments represent the largest inventory of ground stone artifacts from the site. The vast majority of the fragmentary remains of mortars are too small to allow any reconstruction of the basic mortar form. A complete mortar (77-14-212; see Figure 21) was found in association with a presumed burial cache at a depth of 69-79 centimeters in unit N107/E102 (see Figure 6). The mortar is made of sandstone and appears to have been manufactured from a fortuitously shaped cobble which was modified by pecking and abrasion. Maximum length of the mortar is 13.3 centimeters, maximum width is 10.3 centimeters. Depth of the bowl is 4.0 centimers (ave.). This is probably the only example of what would fall into the "Type III" group of Meighan, *et al* (1953:259). Other mortar fragments from the site apparently do not reflect modification of stream cobbles and boulders beyond the preparation of the bowl element of the mortar.

With the singular exception of the mortar discussed above (77-14-212), mortar fragments from the site are of vesicular basalt, andesite or rhyolite, presumably obtained from the Napa River adjacent the site. Five of the fragments recovered, 77-14-91, 92, 137, 138, and 139, are portions of a single large vesicular basalt mortar which was discovered in units N102/E87 and N102/E88 at a depth of 70-80 centimeters. Again, the boulder is unmodified beyond the excavation of the bowl. Maximum length of the mortar is 35.5 centimeters, maximum width is 33.0 centimeters and average depth of the bowl is 12.5 centimeters.

Two mortar fragments, discovered quite removed from one another in the midden are very probably parts of one mortar: 77-14-72 and 73. Both fragments are of the same fine-grained vesicular basalt and exhibit distinctly similar rim forms. 77-14-72 was found in unit N102/E88 at a depth of 60-70 centimeters, while 77-14-73 was found in unit N100/E102 at a depth of 50-70 centimeters.

Among the total of 37 mortar fragments and one complete mortar from the site, only two fragments would appear to possibly not fall within the "Type IV" group of Meighan, *et al* (1953:259). Specimen 77-14-196, recovered in unit N107/E94 at a depth of 30-40 centimeters may be a rim fragment from a well made, shaped mortar. The rim is, however, as with all of the 12 other rim fragments from the site, not squared or flattened, but is rounded in the manner of the "Type IIIa, IIIb and IIIc" mortars of Meighan, *et al* (1953:Figure 5).

Artifact 77-14-41 is a fragment of a small, unshaped mortar and is unique to the collection from the site not only for its small size, but also for the fact that two depressions have been prepared on the cobble which served as the basic form for the mortar. On the one side is a well prepared and apparently utilized depression some 7.5mm deep. On the opposite side, pecking has produced a depression which evidently did not see use (inasmuch as no grinding has occurred to obliterate the pecking marks) before the item was broken and presumably rendered useless. Estimated maximum length and width of the artifact would be on the order of 8 by 6 centimeters. The fragment was discovered in unit N102/E88 at a depth of 30-40 centimeters.

Table 15 provides the reader with the provenience of the mortar remains from the site.

Pestles

Nine complete pestles in various stages of manufacture and 6 pestle fragments were collected in the course of excavations at the River Glen site. Table 16 provides the horizontal and vertical distribution of pestles and pestle fragments within the midden.

Specimens 77-14-210, 213, 214 and 215 (see Figures 16, 18, 19 and 20) were recovered from an apparent burial cache in unit N107/E102 (see Figure 6 and Plate 8). Associated with these pestles was the single complete mortar from the site, artifact 77-14-212 (see Figure 21). Pestle 77-14-210 is a beautifully shaped tool with a maximum length of 29.4 cemtimeters and a maximum diameter of 6.5 centimeters. Overall form of the pestle is conical with the distal end evidencing rounded use-wear indicative of use with the bowl mortar as opposed to the flattened end of pestles employed with slab or hopper mortars. The pestle is made of sandstone, shaped by pecking and smoothed by abrasion. Pestle 77-14-213 is also made of sandstone but lacks the fine workmanship of 77-14-210. The pestle is somewhat squarish in cross section and generally rectangular in form. The ends of the pestle evidence little wear but what wear that is present would seem to suggest the use of the pestle with the bowl mortar. Unlike 77-14-210 which evidences use of only the distal end, both ends of 77-14-213 show some wear. The pestle measures 14.5 centimeters in maximum length by 6.8 centimeters maximum diameter by 5.0 centimeters minimum diameter. The only artifact from the cache made of vesicular basalt is pestle 77-14-214. The pestle measures 12.9 centimeters maximum length with a maximum diameter of 6.35 centimeters and a minimum diameter of 4.6 centimeters at the proximal end. As with the other pestles, use wear would suggest that the pestle was employed with the bowl mortar. Unlike the previous three pestles, 77-14-215 is a simple cobble pestle which is totally unshaped. The sandstone cobble

Table 15:

Horizontal and Vertical Distribution of Mortars and Mortar Fragments

Unit	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	-
20-30	-	-	-	-	-	-	1	-
30-40	1	-	-	-	2	-	-	-
40-50	-	1	-	-	-	-	-	-
50-60	1	-	1	-	-	-	-	s
60-70	s	1	1	0--(*)--3		-	-	
70-80		-	1	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
Depth (cm.)								
0-10	1	1	-	-	-	-	-	-
10-20	-	-	-	-	2	-	-	-
20-30	-	-	2	1	-	-	-	1
30-40	-	-	-	1	1	-	-	-
40-50	-	-	-	-	1	1	1	-
50-60	-	-	-	-	-	2	-	-
60-70	s	-	-	-	-	-	-	1
70-80		?	s	s	s	-	-	1
80-90						-	1	-
90-100						s	-	1
100-110							s	s @ 112cm.

(A single mortar fragment was recovered from Unit N111/E123 at the 0-10 cm. level; (*) = a single mortar comprised of 5 individual fragments was found as a single feature evenly divided between units N102/E87 and N102/E88, totals for units do NOT include these fragments)

is clearly water-worn. Use is evident on both ends of the pestle, as with the vesicular basalt pestle just discussed, but is most evident at the more bulbous end. Maximum length of the tool is 15 centimeters. Maximum diameter is 6.8 centimeters.

Pestle 77-14-210 would appear to fit into the "Type III" group of Meighan, *et al* (1953:260), in that it is a fully shaped pestle of conical form and is more or less round in cross section. Pestle 77-14-215, on the other hand, represents the opposite extreme and would appear to fall into the "Type I" classification of Meighan, *et al*, while 77-14-213 and 214 might be placed in their "Type IV" category, owing to their generally cylindrical nature.

Pestle 77-14-211 (see Figure 17) was found in association with an apparent adult and infant inhumation in unit N107/E98 (see Figure 7). The pestle is made of vesicular basalt, 13.6 centimeters in maximum length, 7.2 centimeters maximum distal diameter and 6.48 centimeters minimum distal diameter. Maximum and minimum proximal diameters are 5.73 centimeters and 4.5 centimeters respectively. Both ends appear to have been employed, although far more use is evidenced on the distal end of the pestle, use indicative of the pestle having been used with a bowl mortar. Although somewhat rectangular in cross section, this pestle may well fall within the "Type IV" of Meighan, *et al* (1953:260).

A complete but roughly formed pestle of rhyolite was recovered from unit N107/E96 at a depth of 10-20 centimeters. The pestle, 77-14-79, evidences pecking over approximately 50% of its surface. The rock from which the tool takes its basic form does not appear to be a water-worn cobble, although it is difficult to asceratin this matter owing to the modification of the rock. A flattened area of one side of the pestle does not evidence pecking. It does however show a slight polish which may be the result of some use which remains undetermined. The flat area of the pestle measures some 13.0 by 6.0 centimeters. Overall dimensions of the pestle are 8.1 centimeters in maximum diameter by 15.7 centimeters maximum length. Use with a bowl mortar is evidenced at both ends of the tool and probably would be classified as "Type II" of the Meighan, *et al* scheme.

An irregular greywacke water-worn cobble employed as a pestle with a bowl mortar would suffice to characterize 77-14-204. The distal end is rounded with use and the proximal end has suffered damage resulting in the removal of a portion of that end of the pestle. Maximum length is 16.9 centimeters, maximum diameter (distal end) is 5.8 centimeters. The pestle was recovered from unit N107/E94 at a depth of 50-60 centimeters.

Table 16:

Horizontal and Vertical Distribution of Pestles and Fragments

Unit	98/88	98/102	100/102	102/87	102/88	102/92	106/87½	106/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	-	-	-	-
20-30	1	1	-	-	-	-	-	-
30-40	-	-	-	-	1	-	-	-
40-50	1	-	1	-	1	-	-	-
50-60	-	-	-	1	-	-	-	s
60-70	s	-	-	-	-	-	-	
70-80		-	-	s	s	?	?	
80-90		-	-					
90-100		s	s					
100-110								

Unit	107/86	107/88	107/92	107/94	107/96	107/98	107/100	107/102
Depth (cm.)								
0-10	-	-	-	-	-	-	-	-
10-20	-	-	-	-	1	-	-	-
20-30	-	-	-	1	-	-	-	-
30-40	-	-	-	-	-	-	-	-
40-50	-	-	-	-	-	-	-	-
50-60	-	-	-	1	-	-	-	-
60-70	s	-	-	-	-	-	-	-
70-80		?	s	s	s	1	-	4
80-90						-	-	-
90-100						s	-	-
100-110							s	s @ 112cm

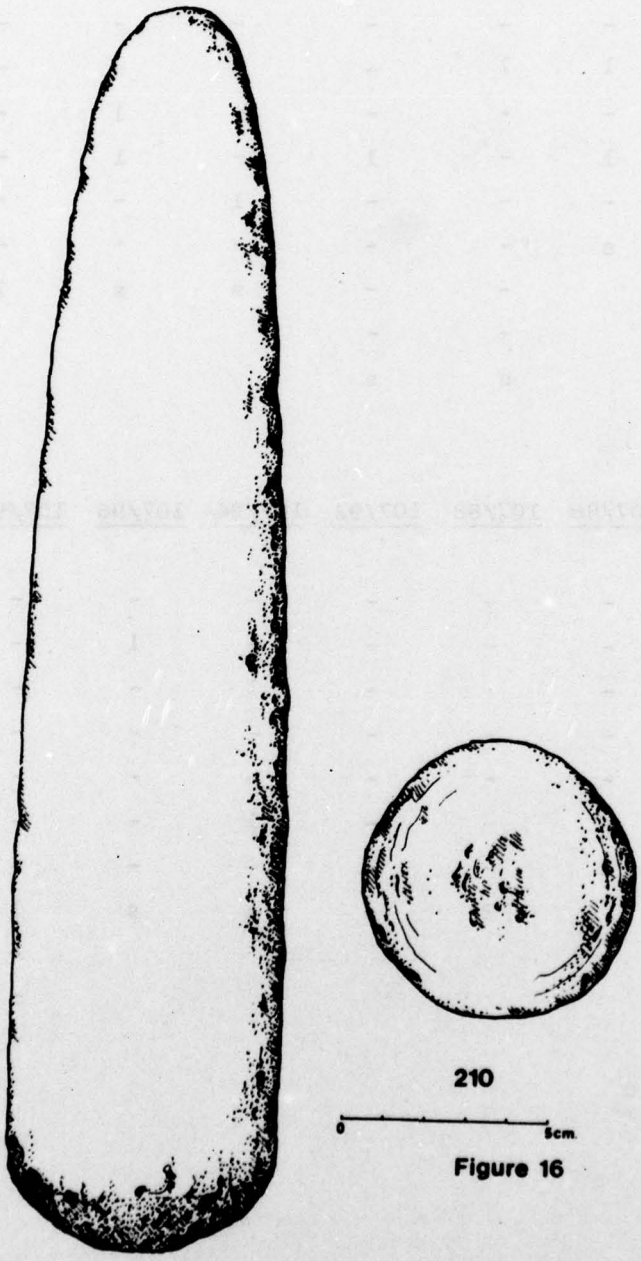
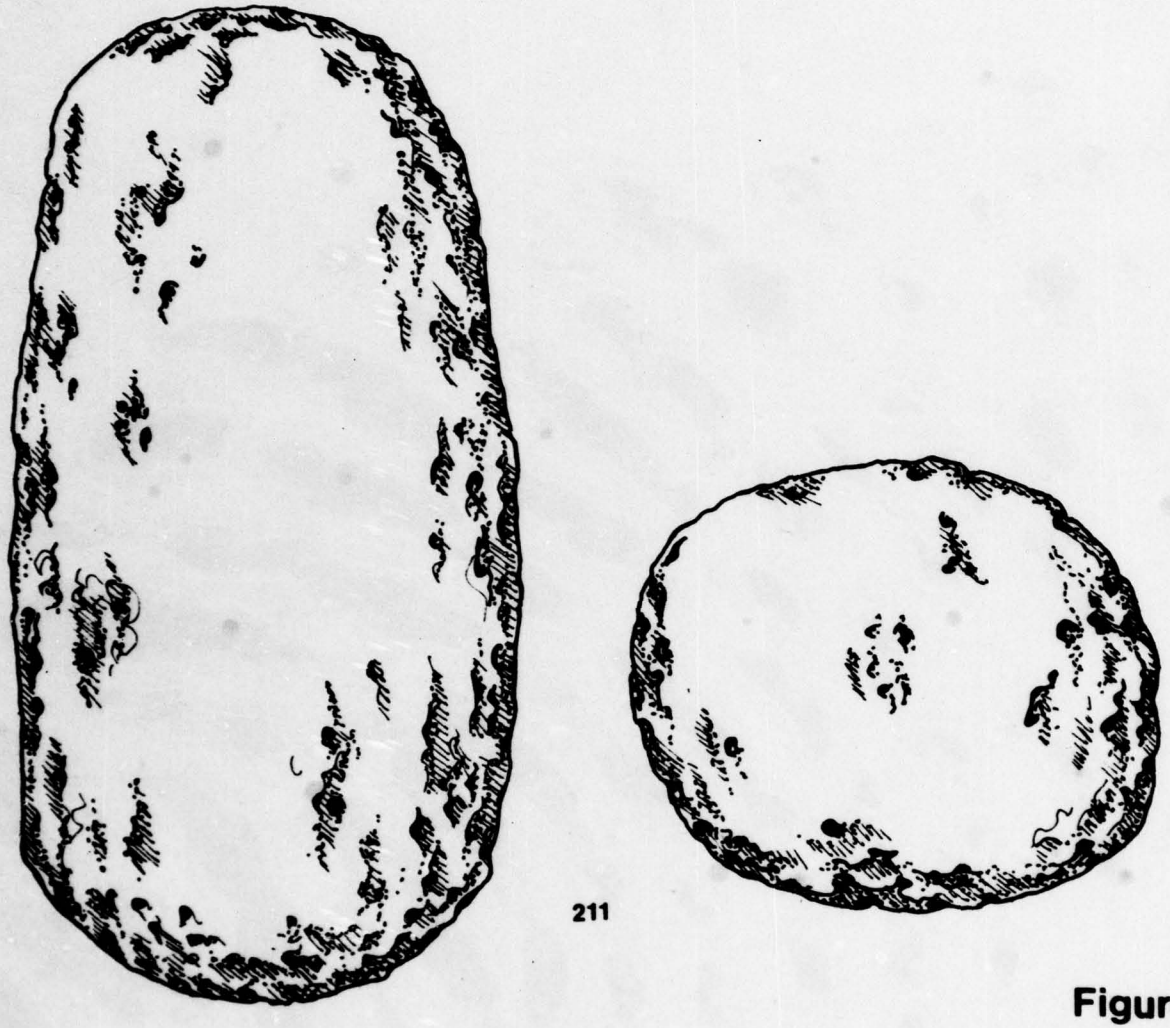
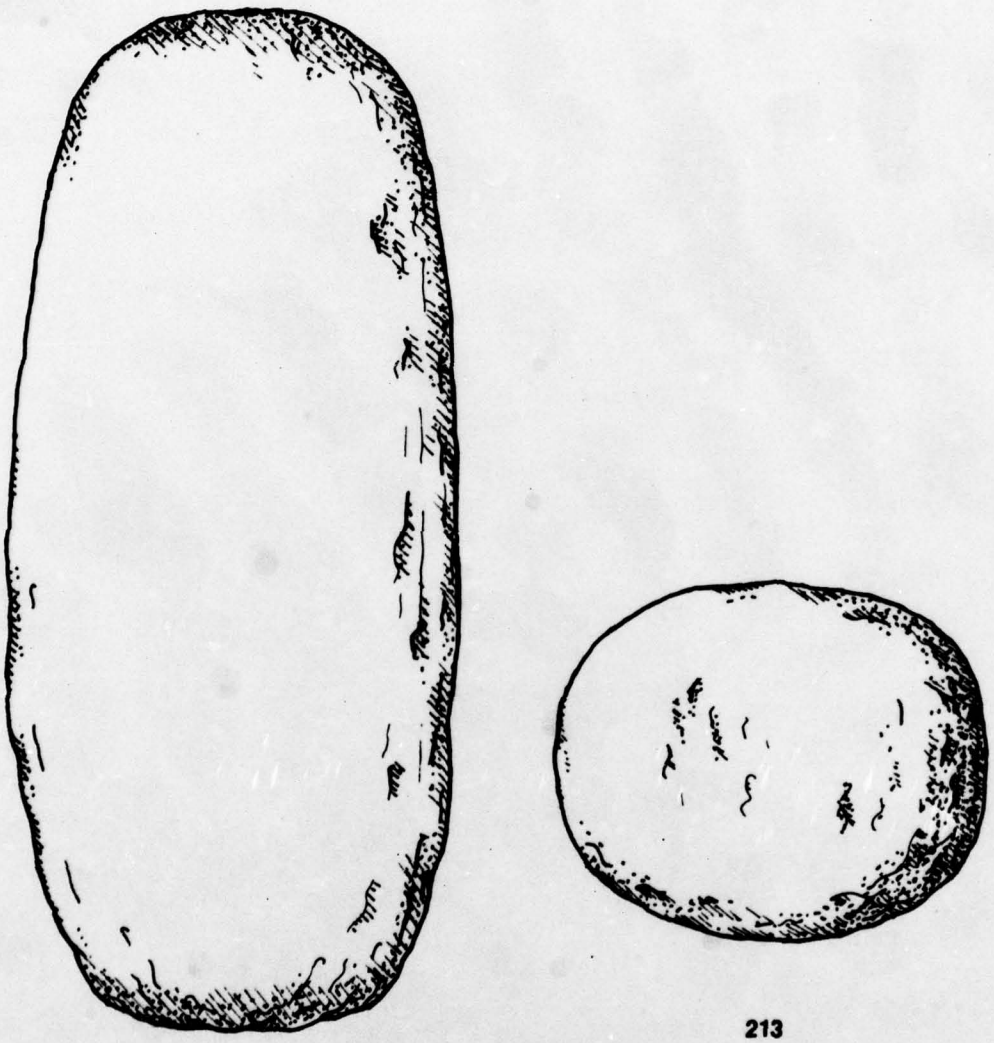


Figure 16



211

Figure 17



213

Figure 18

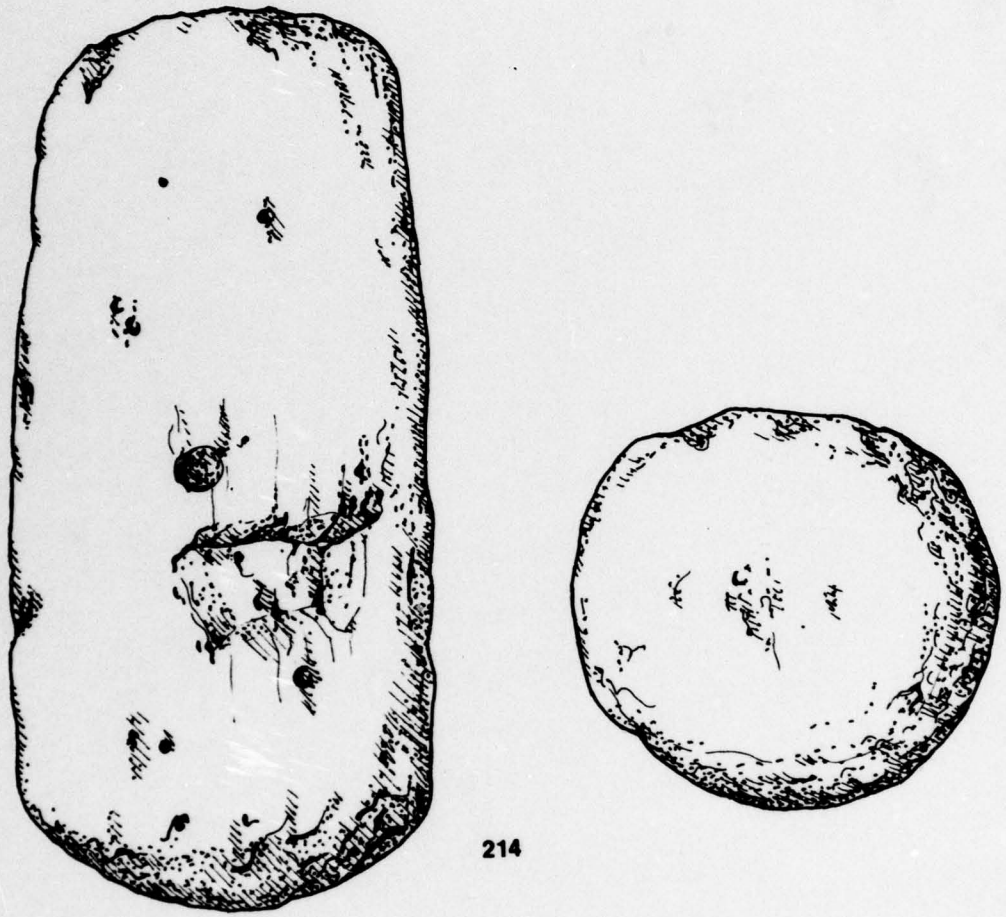


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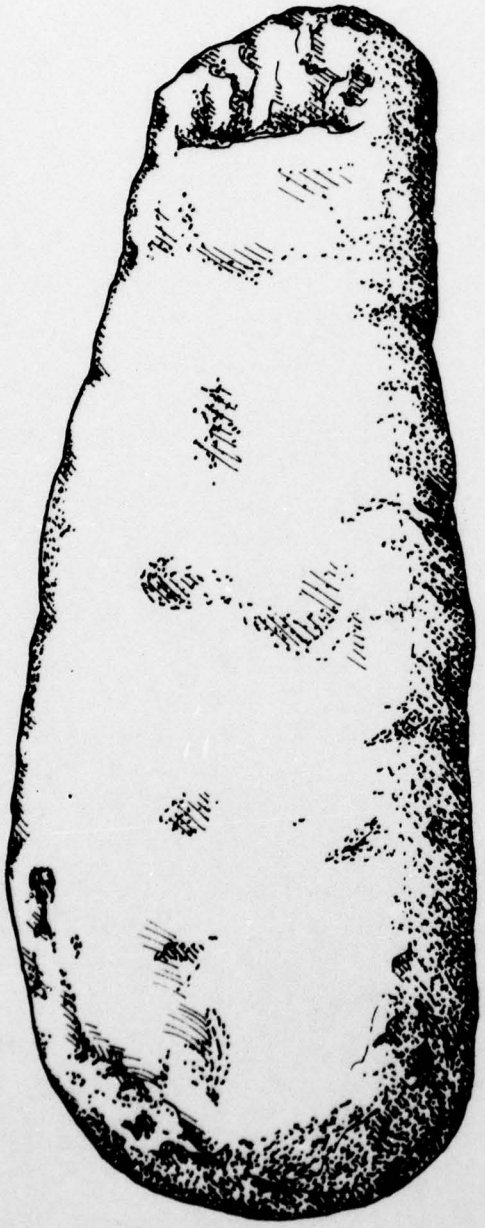
Figure 19



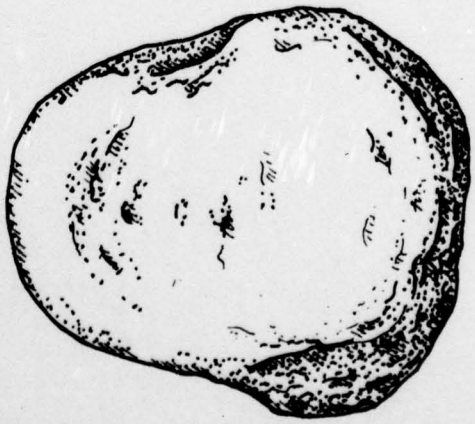


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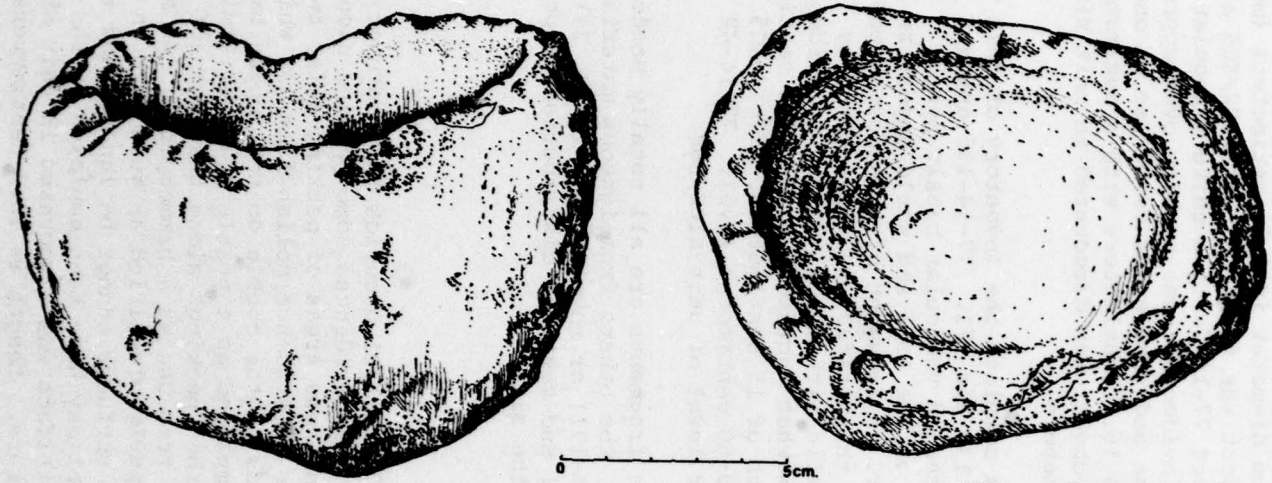
Figure 20



212 Figure 21

Two sandstone cobbles appear to be what may be called "pestle blanks", in that they are water-worn cobbles which have been partially shaped by pecking. 77-14-61 is an oblong cobble 18.7 centimeters long and rather rectangular in cross section. Maximum diameter is 7.3 centimeters; minimum diameter is 5.6 centimeters (measured at mid-length). The artifact was found in unit N102/E88 at a depth of 48 centimeters. Artifact 77-14-74 is a quite irregular water-worn sandstone cobble which evidences some pecking over approximatley 1/5 of the area of the stone and some evidence of use on one end. Maximum length of the cobble is 16.9 centimeters with a maximum diameter of 6.0 centimeters. This object was discovered in unit N100/E102 at a depth of 40-50 centimeters.

Six pestle fragments complete the inventory of this tool type: 77-14-19, 24, 42, 113, 135 and 171. 77-14-135 appears to have been a part of a very well-shaped vesicular basalt pestle. The fragment is from the distal end of the tool and would appear to have been used with a bowl mortar. A fragment of a sandstone pestle, split along the long axis of the artifact is represented by 77-14-42. Use of both ends of the pestle with a bowl mortar is evidenced. The pestle was probably somewhat rectangular in cross section with an estimated maximum length of 15 centimeters. 77-14-135 was found in unit N102/E87 at the 50-60 centimeter level. 77-14-42 was recovered at the 30-40 centimeter level of unit N102/E88.

The remaining pestle fragments are all totally nondescript. 77-14-113 is made from sandstone, the others from igneous material, either vesicular basalt (77-14-171) or rhyolite (77-14-19, 24). Table 16 provides the horizontal and vertical distribution of pestles and pestle fragments from the site.

Rubbingstone

A single artifact (77-14-132) occupies this category. An irregular, water-worn sandstone cobble evidences some pecking along two spines of the cobble. Between these areas of pecking exist two relatively flat areas which appear to evidence polish from use which has rendered them quite smooth. Ends of the cobble do not appear battered as though the tool were employed as a pestle or other similarly functional item. It may be that the "pecking" along the edges of the cobble is, in fact, battering from use as a hammerstone. In such case the tool would be more properly classified as just such an item. However, the polish on the flat surfaces cannot be ignored and it is our suggestion that the tool may have been employed in the processing of skins or hides. The artifact was discovered in unit N98/E102 at a depth of 60-70 centimeters. Length is 13.3 centimeters.

Miscellaneous Items

Several items discovered in the course of fieldwork at the River Glen site are considered to be artifactual, or at least imported to the site by man, but do not fall into any of the previously discussed artifact groups.

Net or Seine Weights

Flat, oval-shaped, notched sandstone rocks (77-14-23 and 77-14-358) are, here, considered to have functioned as either net or seine weights. 77-14-23 measures 10.4 centimeters by 7.5 centimeters and is 1.45 centimeters (ave.) thick. Weight of the rock is 149.3 grams. A single notch is present on one edge, presumably to facilitate attatchment of cordage to the stone. Specimen 77-14-358 is a fragment of a stone which must have been very similar in form and size to 77-14-23. The two artifacts were recovered from units N98/E88 at 36 centimeters (77-14-23) and N106/E87½ in the 20-30 centimeter level (77-14-358).

Quartz Crystals

Neither of the two quartz crystals found at the site (see Figure 10) evidence battering or any other modification. These minerals are not indigenous to the immediate site area and are considered to have been imported to the site by its aboriginal inhabitants. 77-14-114 was found between 30 and 40 centimeters deep in unit N98/E102; 77-14-207 was discovered in unit N107/E98 at the 40 to 50 centimeter level.

Ethnographic information demonstrates the use of quartz crystals by shamanistic and other religious and ideological practitioners throughout California (Kroeber 1925). Evidence for use of such crystals by the ethnographic Wappo is not clearly defined. No presumtion of use of the crystals recovered from the site is made here.

Incised Pebble

A water-worn vesicular rhyolite pebble measuring 28mm x 20.2mm x 10.6mm thick is embellished by a single incised line 21.8mm long on one side. The artifact is number 77-14-176 - found in unit N111/E123 in the 0-10 centimeter level.

Curiosity

A water-worn tuff pebble appears to have a naturally-formed cavity in one face. It is assumed to have been collected by the aboriginal inhabitants of the site as a curiosity. It is entered into the catalogue of materials from the site as 77-14-117, from unit N107/E96 at a depth of 40 to 50 centimeters (see Figure 10).

Unknown Tool Fragment (?)

Catalogue entry 77-14-29 is a fragment of sandstone which evidences some shaping by abrasion and perhaps pecking. One surface of the object is convex, the other concave. The convex surface is smooth while the concave surface is rough. The item may be the result of a fortuitous fracture of some thermally-altered rock and may not be at all artifactual. No definite conclusion will be offered here.

Explanation of Plates

Plate 1: View of CA-Nap-261 to north-northwest

Plate 2: (a) View of CA-Nap-261 to east-northeast; note concrete rubble in center and right portions of picture.

(b) Feature 1 - Unit N98/E102 ("cooking pit")

Plate 3: Crew members engaged in washer screening

Plate 4: Crew taking provenience of artifact using line level and tape measure

Plate 5: View of excavated units looking west from unit N107/E102

Plate 6: View of crew at work from west of unit N107/E86 to east

Plate 7: (a) Probable housefloor feature - unit N100/E102

(b) Crew recording stratigraphic profiles in walls of excavated units

Plate 8: Mortar and pestle cache - unit N107/E102

Plate 9: Rock feature - unit N102/E88

Plate 10: Burial 1 - unit N107/E88

Plate 1

a

b

Plate 2

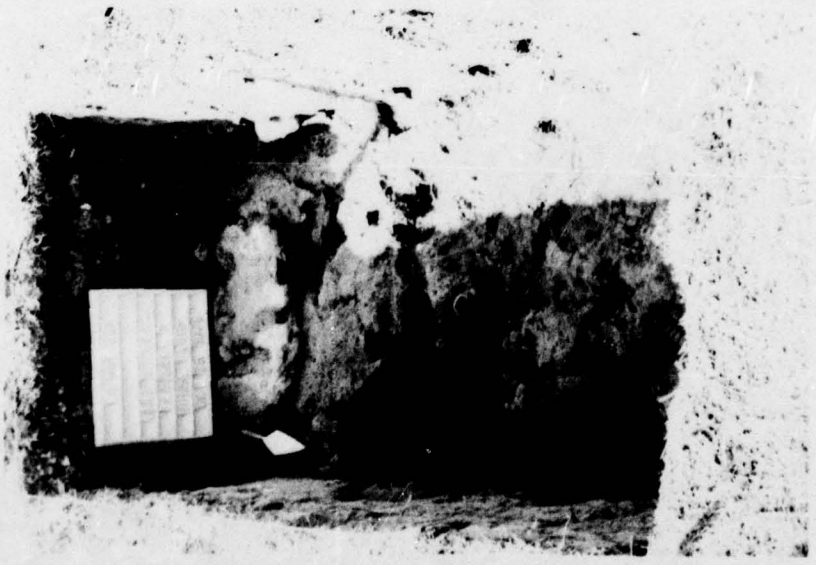
Plate 3

Plate 4

Plate 5

Plate 6

b



a

Plate 7

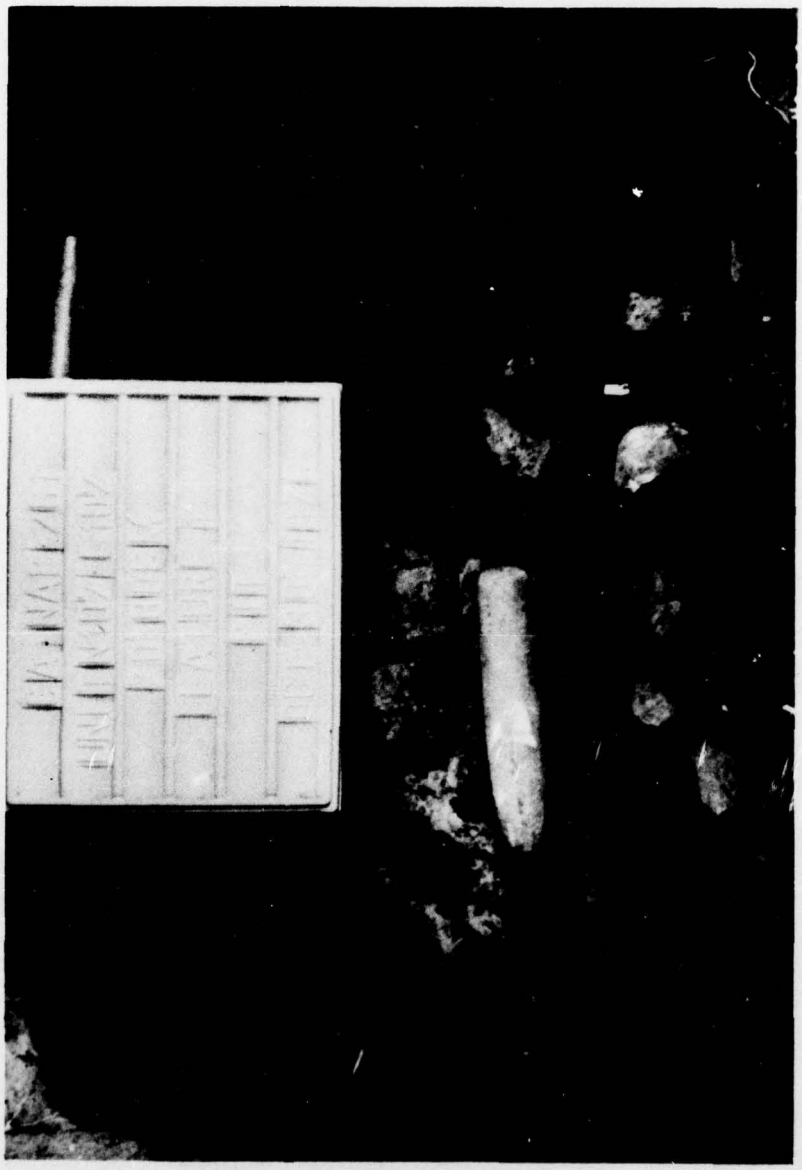


Plate 8

Plate 9

Chapter 5

Interpretations

The foregoing chapters of this report have served to describe the nature of Nap-261 in terms of its setting and in terms of the artifactual and other remains recovered in the course of the archaeological excavation program. It is the purpose of this chapter to interpret the data at hand and relate those data to the framework established by Fredrickson and discussed in Chapter 3.

Temporal Placement

Three means of determining the period(s) of occupation for Nap-261 are available at present: radiocarbon age determinations; obsidian hydration measurements; and, cross-dating using diagnostic artifacts. Toward this end, two radiocarbon dates have been secured from the site, 115 obsidian samples have been analyzed, resulting in the determination of hydration rim thickness for 67 of the specimens, and, despite the paucity of diagnostic artifacts from the site as a whole, the *Olivella* shell bead inventory from the site clearly suggests a temporal assignment for the lower components of the site.

Radiocarbon Results

Teledyne Isotopes has reported the results of two radiocarbon assays of samples collected at Nap-261. The first sample, I-10,046, was collected from the 70-80 centimeter level of unit N107/E100 and yielded a date of 2505 $\pm$ 95 years B.P. (555 B.C.). The second sample, I-10,047, collected from unit N107/E102 at a depth of 90-100 centimeters yielded a date of 1965 $\pm$ 170 years B.P. (15 B.C.). Although a total of six samples from the site were submitted for age determination, only these two contained sufficient datable material. It must be clearly expressed, that, unfortunately, neither of these dates is associated with features or artifacts in the midden which may be taken to be "diagnostic". Both samples share the dubious distinction of dating what appears to be the base of the midden. If nothing else, they reaffirm our conviction that the site has been disturbed to a considerable degree, throughout its depth and doubtless throughout its history.

Obsidian Hydration Results

A total of 115 obsidian samples from the site were selected and prepared for measurement of the hydration layer presumed to be present on each. Of the 115 samples prepared, 67 had measurable hydration rims; the remainder had no visible rims (nvr). Table 17 provides the reader with the provenience and average rim thickness (in microns) for all specimens examined. Appendix 5 gives a more specific accounting of the measurements obtained on each specimen and provides the catalogue number for each sample.

Samples for obsidian hydration were selected in an effort to answer several questions about the site, apart from the obvious temporal problem. It was hoped that the obsidian samples would correspond closely with any radiocarbon age determinations from the site and thus serve as an internal relative dating technique for the various site components which might be recognized during our analysis. Secondly, it was hoped that the hydration results would serve to indicate the extent to which the midden deposit had been disturbed and to help isolate those areas of the site which were most or least disturbed, relatively speaking. Finally, it was anticipated that the obsidian hydration results could be employed to further refine the dating technique itself.

A quick glance at Table 17 will reveal that the site is rather obviously disturbed, in all areas and at all depths. While there is a paucity of rims in the sample measuring less than 2.0 microns (7, in fact), 48 samples evidenced no hydration rim which could be detected. This is to say, that if we take this preponderance of samples without hydration to suggest a recent component in the site, then we must also account for the lack of samples with thin hydration rims. The presence of samples with no visible rims is always an interpretive problem. To some extent, we may assume that a percentage of the samples with no visible rims are a product of slide preparation procedures and that the rims have simply been lost. In the case of the present sample of 48, this is probably the case with 6 of the slides (77-14-126, 168, 263, 267, 272, and 334). This, however, leaves us with 42 slides which must be explained.

In examining the provenience of the samples with no visible hydration rims, it may be noted that 31 of the 48 are from the 0 to 40 centimeter levels of the site, that is, those levels of the site which are most obviously disturbed. Another 6 samples without rims are from the 40 to 50 centimeter levels of the site, a layer which is almost certainly disturbed to some degree. Finally, yet another 6 samples without hydration rims are from levels below 80 centimeters. It is our interpretation that the base of the midden deposit lies

Table 17:

Provenience of Obsidian Samples with Average Hydration Rim Measurements

Depth (cms.):	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110
Unit:											
N98/E88	nvr*		2.9	2.7	4.0	nvr					
	1.2		nvr	3.3	3.9	1.5					
	nvr		nvr			3.1					
	nvr										
N100/E102	1.2	3.4	2.7	nvr		3.0					
	nvr	nvr		nvr							
N102/E87	nvr	2.0	4.3	nvr	3.0	4.3		3.8			
		nvr	nvr	3.2	3.5	2.3		3.0			
N102/E88			2.4								
			1.1								
N106/E87½	4.7	3.0	nvr	2.3	nvr	3.9					
	3.8	nvr	2.9	nvr	nvr	3.0					
N107/E88	nvr	4.1		3.1	3.3						
	nvr			3.4							
N107/E94		nvr		2.9							
		nvr									
N107/E96	2.5										
N107/E98		5.1	3.0	4.0		nvr					
				nvr							

Table 17 (cont.):

Provenience of Obsidian Samples with Average Hydration Rim Measurements

Depth (cms.):	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110
Unit:											
N107/E100	3.5	nvr	2.8	nvr	nvr	nvr	3.2	4.2	nvr	nvr	nvr
	nvr	3.9	3.5	4.1	nvr	3.1	nvr	3.9	nvr	3.9	
N107/E102	nvr	2.1	2.8	nvr	nvr	3.1	4.1	2.9	2.5	nvr	
	nvr	nvr	nvr	nvr	nvr	4.0	3.2	nvr		nvr	
						3.2		1.8			
N111/E123	nvr		3.0	3.0	3.0	3.5					
	1.2		1.2	2.3							

* nvr = no visible hydration rim

at or about 70 to 80 centimeters and that cultural material recovered below that level is found in intrusive features, either man-made or the result of rodent activity.

Contractual obligations required that we prepare no more than two hydration samples from a single level in any given unit. Thus, in an effort to secure samples for hydration rim measurements, it was necessary to use non-artifactual as well as artifactual material. This is not to imply that the use of non-artifactual material is in some way invalid, rather, it is a statement if fact. Non-artifactual obsidian was taken from level bags, examined for excessive breakage or battering and selected in order to fulfill the research goals previously stated. An interesting statistic emerges, however, in that 35 of the samples without visible hydration rims are non-artifactual obsidian samples. Of the artifactual samples without hydration rims, 7 are from the 0 to 10 centimeter level (77-14-6, 14, 43, 44, 124, 126 and 175), 3 are from the 10 to 20 centimeter level (77-14-8, 167, 168), 3 are from the 30-40 centimeter level (77-14-47, 52, 205) and only 1 from 60 centimeters (77-14-349).

The problem of how to interpret the samples without visible hydration rims remains. It seems clear that the vast majority of the artifactual specimens in this group are from the upper portions of the deposit and may be considered, along with the few samples with less than 2.0 micron rims, as yet another hint that a late component was once a part of the site but is no longer intact. A comfortable interpretation of the non-artifactual material would be to suggest that it represents manufacturing debris which was a part of the (presumably) destroyed uppermost component of the site which has become mixed with the surviving midden. Such an explanation would, however, also require us to accept that a great deal of manufacturing debris was being generated during late prehistoric occupation of the site, considerably more so than in earlier times. This is not an altogether implausible suggestion, however, it may be suggested that the solution to the dilemma lies in the examination of a considerably larger sample than is presently available; a sample chosen with this particular problem in mind.

While the picture first perceived from an examination of the individual hydration rim measurements is one of considerable disarray, an inspection of the data in Appendix 5 indicates that there is actually a good correlation between the obsidian hydration results and the age determinations secured for the site by radiocarbon dating. If we employ Clark's (1964:185) correlation scheme for relating hydration rates of obsidian to years before present (B.P.), we see a very definite clustering of hydration rim thicknesses approximately equivalent to the age range suggested by the

radiocarbon dates. That is, the C-14 results would suggest that the site was occupied between 1800 and 2600 years B.P., while the hydration results clearly suggest major occupation between 1800 and 2800 years B.P. While we recognize that Clark's scale is somewhat artistic and is generalized for the whole of Central California, it is heartening that his proposed scheme does not contradict the age determinations for Nap-261. While some may suggest that Clark's rate may not be applicable on the grounds that his obsidian samples may not all have been from a single source (Napa) as are the materials from Nap-261, we would counter that there can be no question that the vast majority of Clark's samples probably were of Napa obsidian (cf. Jackson 1974) and that possibly the real potential variable in applying his rate lies in the question of mean annual ground temperature in specific regions as opposed to the question of chemical variability in obsidians (cf. Friedman and Long 1976).

Just as the obsidian hydration results hint of a late occupation phase for the site, so too the cluster of rims measuring between 3.8 and 5.1 microns would seem to hint at an occupation of the site at a time earlier than the earliest of the radiocarbon dates. This is considered a viable possibility. Given the small amount of material collected from the site, the limited sample size completed to date and the fact that we have but two radiocarbon dates, it is a reasonable proposition to believe that the earliest occupation of the site may have occurred some 3000 years B.P.

Cross-dating

Of the artifactual materials from the site, the *Olivella* beads are clearly the most useful in relating components of Nap-261 to other sites in Central California. The type G3a, C2, F3a, F2a, "G5", and G2a beads from the site are clearly indicative of the "Middle Horizon" of the Central California Taxonomic System of Heizer, *et al*, (1939) or the "Houx Aspect" of Fredrickson's (1974) "Berkeley Pattern"*. The provenience of these beads clearly suggests that the portions of the site below 40 centimeters are probably "Early Middle Horizon"/"Upper Archaic".

Again, however, the suggestion of a later component for the site is indicated by the recovery of the "semi-ground" *Olivella* bead and the steatite bead. The *Olivella* "semi-ground", if we may extrapolate from southern California, is indicative of occupation post A.D. 1800,

* No lengthy interpretation or justification of either taxonomic framework will be attempted here. The uninitiated is referred to Bickel 1976, Fredrickson 1973, 1974 and Gerow 1968 and 1974.

while the steatite bead is a suggestion of "Phase 2, Late Horizon" (in the Central California Taxonomic System) or "Augustine Pattern" ("Emergent Period") of the Fredrickson scheme.

Stone tools from the site are generally not helpful in establishing the temporal position of the site. The single probable arrow point from the site (77-14-184) has an appropriately thin hydration rim (1.2 microns). Other biface tools from the site are less clearly diagnostic. On the basis of studies completed using materials from Mrn-170 by Jackson and on a study of that site completed by Chavez (1976), it is suggested that the projectile point/knives from the site are also indicators of "Middle Horizon" occupation. The obsidian hydration results would also seem to support this argument. In this respect, as with the *Olivella* beads, components of the River Glen site are of ages comparable to components at Nap-1 and Nap-348.

Mortar fragments and pestles from Nap-261 are also not especially helpful in placing the site temporally. None of the pestles evidence wear which suggests use with a hopper mortar and, conveniently, no fragments of hopper mortars have been recovered from the site. Mortar fragments are all largely unshaped and lack the finish characteristic of later mortar forms in the Bay Area. The representatives of these two tool categories from the site would not seem to betray an assignment to the "Middle Horizon" or "Houx Aspect" of the "Berkeley Pattern."

The scarcity of bone tools from the site is perplexing. An assignment to the "Middle Horizon" is generally taken to imply that there is a considerable tool industry represented at the site. A model for the Napa area would be Nap-1, where we find a broad representation of bone tool types (cf. Heizer 1953). Not so at Nap-261, where perhaps the only bone tools which may be assigned to the "Middle Horizon" with confidence are the two "eyed" needle items.

Since only one inhumation at Nap-261 was exposed, we have little data upon which to evaluate mortuary customs. The exposed burial (Burial 1; see p. 4.34; Figure 8 and Plate 10) rested in a tightly flexed position, on its back, and appeared to be oriented to the northwest. This burial did not have associated artifacts. Potential burial/artifact features, such as that in unit N107/E102 could not be investigated. There is every reason to believe, however, that this feature was directly comparable to others described by Heizer (1953) for the "Napa Region". Without the excavation of human remains at Nap-261 it is not possible to present a meaningful comparative discussion of mortuary practices. In fact, even though it is assumed that the feature in unit N102/E107 (comprised of mortars and pestles) was part of an inhumation feature, this cannot be stated with certainty, inasmuch as no more than a single human

rib fragment was encountered in association with the feature. It may be argued with equal vigor that the rib fragment was in fortuitous association with the collection of tools. The point cannot be resolved under the current circumstances in any event.

Cross-dating the site by comparative studies of midden constituents has not proven fruitful. The uppermost portions of the site are obviously totally disturbed, to the point where we may legitimately question the usefulness of any materials recovered from depths above 40 centimeters. Although variations occur between parts of the site and between different levels in the site, it may be argued that, for example, the increase in shell at the lower depths, is simply a factor of survival. Whereas plowing and other activities have probably pulverized the shellfish remains in the upper portions of the site, those deeper parts of the site remained relatively intact. Thus, the large shell fragments were caught in the excavators' screens.

The very presence of shellfish remains in the site may, however, be, in and of itself, an indication of antiquity. As sealevel fluctuations altered the level of San Francisco and San Pablo Bays, the salinity of the Napa River must also have changed, perhaps to the degree that such shellfish as *Mytilus edulis* were obtainable in the near or immediate proximity of the site. This topic of fluctuation of sealevel, subsidence of the land and other related phenomena, is the subject of current studies by the United States Geological Survey. Although only tentative results are available at present, it may be anticipated that forthcoming publications by the Geological Survey will be of use is resolving this question.

Biophysical Adaptations

Midden constituents from Nap-261 provide the most direct evidence of the ways in which the aboriginal inhabitants of the site exploited their environment. Detailed discussions of the bone from the site are presented in Appendices 1 and 2. In sum, it may be said that the occupants of the site exploited a variety of species indigenous to the environment in the immediate proximity. In fact, the impression gained from the study of the constituent materials of the site as a whole is one of very localized exploitation. Preservation of pollen has proven to be very poor in the site soil. What limited data could be gained is discussed in Appendix 3.

Bone

Bone is not plentiful as a midden constituent at Nap-261, it is,

however, the predominant faunal constituent. Whether the relative lack of bone in the site is simply a factor of aboriginal exploitation, that is, the aboriginal occupants of the site were simply not engaged in extensive hunting while at the site, or whether the paucity of bone material is due to some characteristic of the soil of the site which is not conducive to its preservation will require further testing to resolve. Simons (Appendix 2) has discussed the differences between the reported bone materials from Nap-14 and the inventory of species represented at the River Glen site. A problem which only adds to the perplexing nature of this constituent is the absence of fish species which are commonly represented as major food species in other sites in Central California and particularly in the San Francisco Bay Area, that is, there is a total absence of steelhead remains in the sample recovered to date. As Schulz (Appendix 1) has pointed out, there is, altogether, a scarcity of fish remains which he interprets to mean that fishing was not an important industry practiced by the aboriginal occupants of the site. Alternatively, we return to the possible determination that soil conditions are not favorable to the preservation of bone at the site.

There is no clear indication of changes in the nature and frequency of bone in the site, either vertically or horizontally. While some units certainly exhibit considerably more bone than others in the discussion presented in Chapter 4, we cannot definitely assign the cause of this occurrence to either changes in subsistence or other modifications of behavioral adaptation at the site by its occupants. Certainly the lower levels of the site, again, those below 40 centimeters are referenced, seem to contain relatively more bone than the uppermost levels. We cannot, however, discount the thorough mixing of the upper levels as a factor in explaining this occurrence. A similar situation has been noted for the distribution of shell in the site. Specific features, for example, the feature found in unit N98/E102 (Figure 5), were discovered to be laden with bone and shell. Apparently this feature is what remains of a cooking or roasting pit constructed for the preparation of various meats.

Shell

Of the various species of marine shellfish noted to be a part of the midden constituents at the site, *Mytilus edulis* is far and away the most abundant, with *Ostrea lurida* ranking as the next most common. In this regard, there is probably ten times the amount of *M. edulis* in the site as *O. lurida*, with only occasional singular occurrences of other species as noted in Table 5.

It is argued here, granted on the most tenuous of evidence, that

at least for the initial 1000 years of occupation at the site, salinity conditions in the Napa River were such that *M. edulis* could be obtained by the site occupants in the proximity of the site, certainly at a distance of less than 1 mile downstream. If people were to occupy the site today, they would have to venture a good deal farther toward the mouth of the present Napa River in order to exploit the same species. The occurrence of the other species in the site is almost incidental, although a larger sample from the site would place their role into better perspective as indicators of exploitative strategies of the aboriginal population.

Stone

It is suggested that virtually all of the stone material, both artifactual and non-artifactual, found in the site either occurs as a natural soil constituent or was recovered from the Napa River by the site's occupants. By artifactual stone, I refer to those types of stone from which tools were fashioned: obsidian, basalt, chert, tuff and sandstone. The geological setting (see Map 2) of the site is such that all of the rock types found in the site may be transported in the Napa River as erosional products from geological formations upstream.

The question of the source of obsidian is interesting in this regard. While the examination of obsidian from the site in order to estimate the amount of material which actually came from the river (see Table 6) is hampered by the fact that the process of tool manufacture serves to remove the very cortex which we sought to study, it seems a plausible and supportable argument that the vast majority of the obsidian employed at the site was derived from the river deposits. It is further suggested that pebbles and cobbles of obsidian from the river were used for the manufacture of such tools as scrapers and choppers, however, the occupants of the site either traded for obsidian from the primary source (Napa Glass Mountain, near St. Helena), or visited the primary source in order to obtain material for the manufacture of better biface tools (points/knives). If this is the case, then we would expect to find the majority of obsidian pieces with cortex to have water-worn cortex as opposed to natural cortex; in fact, this is precisely what we find.

On a more general note we may pursue the issue with regard to the determination of the source of obsidian found in the Napa area as a whole. While trace element analysis is sufficient to determine the original source of obsidians, it cannot, of course, serve to tell us of the various depositional histories of that obsidian. As

a case in point, we may note the various sources of "Napa Glass Mountain" obsidian. Shortly after the formation of the primary flow in the Pliocene times, much of the obsidian from the primary flow was redeposited in secondary sedimentary formations of Plio-Pleistocene Age. These deposits are readily observed in the upper Napa Valley, especially along the Silverado Trail near St. Helena and Angwin. These deposits, in turn, have been subjected to erosion, most recently by the modern Napa River. Thus, there are primary, secondary and tertiary sources of "Napa Glass Mountain" obsidian in the Napa Valley. Secondary deposits of this obsidian may also be found as far west as Santa Rosa. Thus too, in the discussion of obsidian as an export item, we cannot assume that the quarry at Glass Mountain was the sole source of obsidian. Although it was unquestionably the major source of ethnographic times, we cannot assume *a priori* that such was always the case.

Discussion

The impression which one gains from an analysis of the site constituents of Nap-261 is that of a population which focused on the exploitation of a very localized resource base. It seems doubtful that the population exploited an area beyond a radius of 2 to 3 miles of the site, and perhaps less, depending upon the size of the population at the site.

A comparison of site distributions in the San Francisco Bay area begins to compile evidence for a patterning in the distribution of sites, especially sites of the "Middle Horizon". Thus, we would suggest this brief, and emminently testable, model. While there is virtually nothing "new" about our suggestion, we submit that it bears writing and perhaps some thought.

A basic assumption for the model is that a human population, especially a hunter-gatherer population, will locate in an area which will best supply its needs, in terms of food and shelter. Thus, we expect to find "initial" settlements in those ecological settings which have the potential of providing the maximum of resources, both in terms of quantity and quality, as defined by the population exploiting them. Whether the "least amount of effort" aspect is applicable in this model is debatable, but one which is not necessarily important to the present argument.

In Marin County, we see the distribution of the earliest known sites in that area to be at or near the mouths of streams as they enter the Bay. Initially, there was a considerable area of marshland at the margins of the Bay which afforded the aboriginal peoples

yet another ecozone to exploit. Thus, in this locality the population could exploit the resources of the Bay itself, the marshlands about its margins, the riparian environment of the stream course, the broad piedmont which rings the Bay and the hills of the hinterland. An enviable position indeed. What the data from Marin would seem to suggest, in this regard, is that as populations grew in the "initial" settlement area, some portion of that population elected to leave an establish a new area of residence. Whether the pressures for departure were benign or otherwise will not be pursued on this general level, and no Malthusian factors are suggested or implied. These populations which "budded off" relocated in an area which, as closely as possible, approximated the habitat of the initial population locus. Population expansion and migration occurred in this manner until all such ecological settings were filled.

What is clearly implied here is that human populations will elect to sustain themselves "in the style to which they have become accustomed" as opposed to maintaining kin or other social ties and settling in areas of secondary ecological/economic potential. It is argued that this settlement pattern persisted until the end of the "Middle Horizon" (of the Central California Taxonomic System) or the middle part of the "Upper Archaic" in Fredrickson's model. Beginning in "Phase 1, Late Horizon" or at some point in the "Upper Archaic", population size was such that these initial settlement localities were no longer available for settlement. The only alternatives for newly "budded" populations were warfare against an established population or settlement in areas with less than optimal resource potential. The latter course appears to have been most commonly adopted. Thus, in the archaeological record we find sites with "Phase 1" components to be not only the long-established sites with "Middle Horizon" beginnings, but also smaller single component sites which also serve as loci for "Phase 2, Late Horizon" populations. This trend continues and escalates through time until we see the establishment of sites far back for the mouth of the streams, with the latest sites being single component late "Phase 2" sites. It is argued, and in this we believe Fredrickson would agree (cf. Fredrickson 1974), that it is not until the pressure of populations competing for a smaller and smaller piece of the resource base becomes discernable that people then turn their attention to the establishment and maintenance of social relationships between groups.

Returning to our discussion of Nap-261, then, we would suggest that the initial population at Nap-261 was one which entertained minimal ties with surrounding populations, which were few in number anyway, and which, rather, was self-reliant in its exploitation of a small but highly productive resource base. It would appear that the data from the site supports this contention.

Interaction with other groups, at considerable range is indicated by the materials from the site, especially by the presence of *Olivella* shell beads. Some suggestion has been made (cf. Fredrickson 1967, 1976) that manufacturing of these beads took place at the site. This could not be demonstrated on the basis of the materials recovered in the course of this study. Nevertheless, contact with the coastal regions is indicated, most likely indirect contact.

Perhaps the most useful means by which we might determine the nature and degree of group interaction between the inhabitants of Nap-261 and other populations and cultures in Central California is from the analysis of grave goods. Unfortunately, this avenue of study was closed to us. Based on the most minimal data base, we see clear affinities with such sites as Nap-1 (cf. Heizer 1953) and a general similarity with cultures of similar age in the Bay Area as a whole. However, in this regard, we are basing our conclusion on a handfull of artifacts. The data simply does not exist from the site for us to "define" a group identity for its occupants and the site appears to be lacking those late prehistoric components which would allow us to ascertain aspects of late period development in the Napa Valley or determine social and temporal boundaries for ethnographic populations of the region.

There is some suggestion of social differentiation based on the way the dead were apparently interred. If the major feature in unit N107/E102 is indeed a burial feature, then it is considerably different from the interment referred to herein as Burial 1, which lacked any grave goods whatever. This is not unusual for "Middle Horizon" sites. Throughout the Bay Area we find evidence of what is frequently termed "ranking" or status differentiation in practices relating to the disposal of the dead.* Disposal of the dead in the "Napa Region" seems to frequently involve placing mortars and pestles as grave goods with the deceased (cf. Heizer 1953). Beyond these sparse comments we may offer no further discussion for lack of data. Likewise, we have no data base upon which to define a "developing complexity of intergroup relationships", although in our model such is assumed to occur.

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* See especially T. F. King's discussion of the mortuary complex at Mrn-27, in, *The Dead at Tiburon* (1970), Northwestern California Archaeological Society, Occasional Paper 2.

Chapter 6

Summary and Conclusions

Archaeological excavations at CA-Nap-261, the River Glen site, have revealed a prehistoric occupation at the site which may have originated some 3000 years B.P. Major occupation at the site is believed to have taken place between 1800 and 2600 or 2800 years B.P. and may have extended intermittently into the early 19th century.

CA-Nap-261 has sustained heavy damage due to a variety of man-induced and natural factors. Long-term cultivation of the site area, and construction activities associated with the maintenance of the Napa River levees have probably resulted in the removal of terminal occupational strata at the site and have resulted in the disturbance of portions of the existing site to depths in excess of 40 centimeters below present ground surface.

Analysis of the materials recovered from the site has led to the interpretation that the aboriginal inhabitants of the site during the "major occupation" period of the site were involved in a socio-economic system which stressed the self-sufficiency of the village community. Exploitation of a rather limited territory is suggested and, it is concluded, long-range exchange systems were based on numerous individual exchanges between many intermediaries as opposed to long-range travel and movements on the part of the village members. We would concur with Fredrickson's (1973; 1974) suggestion that extensive inter-community socio-economic and political systems were not forthcoming until late prehistoric times in Central California.

Artifactual and feature remains from the site suggest that the inhabitants were primarily gatherers who concentrated on the exploitation of vegetable resources. The presence of mortars and pestles in the site is believed to indicate the exploitation of the acorn through all occupation periods at the site. Acorns could have been collected in the immediate vicinity of the site and at considerable distances. Riverine exploitation is suggested by the recovery of fish remains. The taking of game is evidenced by the recovery of mammal bones from the site midden. Some foods were prepared by cooking in hearth/oven features. Such features were commonly found to be accompanied by shellfish remains, particularly *Mytilus edulis*, and by mammalian remains, especially mule deer. Ash deposits are a common occurrence in the midden, as they are in sites throughout the Bay Area, suggesting that fires were maintained for a variety of reasons, some of which included cooking. A possible structure floor was discovered and is suggestive of occupation of the site

over a period of time by the occupants which warranted or justified the construction of fairly substantial structures.

Some evidence of status differentiation among members of the population is suggested by the discovery of burials, some of which have associated grave goods, some of which do not. It is recognized that the archaeological record may facilitate an improper interpretation of such features in that very valuable, but perishable, items may have been placed with high-status individuals, but for which no trace is found in the archaeological record. On the other hand, the archaeological record for the San Francisco Bay Area as a whole suggests that high-status individuals are interred with grave goods, while lower-status persons are not. The practice of including mortars and pestles as part of grave furnishings appears typical for the Napa Valley area, especially in "Middle Horizon" times.

Insufficient data have been recovered from the site to document any change in midden constituent frequencies which may be taken to be indicative of adaptational changes on the part of the site inhabitants or changes in the status of the village community as a whole.

Reliance upon a highly localized resource base is indicated by the nature of the midden constituents recovered. All materials collected from the site, with the exception of a few fragments of ocean coast shell, may be obtained within an area in the close proximity of the site. It is suggested that changing salinity of the Napa River due to variations in sealevel and gross tectonic movement may account for changes in general environmental conditions of the river between the time of initial occupation of the site and current conditions. Thus may well have been an important change to examine in the archaeological record of the site had the upper and more recent componnents of the site survived. These are assumed to have existed on the basis of the recovery of an arrow point, a steatite disc bead, a "semi-ground" *Olivella* bead and fragmentary remains of scapulae tools. A glass bead recovered from the site is thought not to be a "trade" item.

On the basis of the data at hand, inferences cannot be made regarding late prehistoric period adaptations, social interactions between ethnographic populations, mortuary complexes, and intrasite evidence for developing social complexity. On the whole, the limited inventory of artifacts from the site seems comparable to inventories from similar temporal components at such sites as Nap-1 and Nap-348. A paucity of detailed constituent analyses from other sites prohibits comprative studies in this mode except on the most general level.

On the basis of the data from Nap-261, and on the basis of work completed at other sites in the San Francisco Bay Area which evideence "Middle Horizon" components (e.g., Mrn-27, Mrn-138, Mrn-170, Ala-328, Ala-329, Son-299, etc.), it is predicted that a substantial cemetery complex exists at Nap-261; one which has considerable promise of cultural diversity and archaeological value.

The site is somewhat enigmatic in the paucity of fish remains, especially those fish species which one would expect to dominate that class of faunal remains, that is, steelhead and salmon. The relative lack of mammal bone in the site is also interesting. Coupled with the relative absence of these remains and the obvious focus by the site's inhabitants on very localized resources, we are prompted to offer an alternative suggestion regarding adaptive behavior in the temporal range of the site, specifically during the "Middle Horizon" period. That is, if we assume that the resource base area or that territory exploited for subsistence purposes by the indigenous population was relatively small (very likely on the order of 3 miles diameter), and, lacking any clear evidence to suggest a seasonal occupation and abandonment cycle for habitation at the site, we may logically conclude that the population was sedentary and not wide-ranging foragers in the stereotype of modern hunter-gantherer groups. Also, given the absence of fish species of major economic importance to ethnographic populations and, if we discount soil conditions as a negative preservation factor, we may argue that riverine exploitation was not as important to the survival of the population as was terrestrial exploitation. While we recognize that the absence of the remains of steelhead and salmon argues for a possible interpretation of seasonal occupation of the site, we would also acknowledge that such an argument is not altogether compelling. Rather than force the data into existing interpretive frameworks we offer an interpretation which suggests a stable population, successfully adapted to the exploitation of terrestrial resources - one which only occasionally supplements those resources with marine or riverine products. It would be our prediction, however, that had we been afforded the opportunity for the examination of the upper components of the site which we presume to have been destroyed, we would have found a shift in subsistence practices which would have been interpreted to be indicative of a greater reliance upon riverine and marine produce by late prehistoric period peoples.

Further research at the site appears warranted on the basis that the site has exhibited numerous attributes which one would not anticipate on the basis of data previously gathered in the Napa area, including those just mentioned. The site is also potentially one of the earliest in the Napa area known to date and as such is one which may give evidence regarding the transition from or interaction with the "Borax Lake" period peoples of the North Coast Ranges.

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Appendix 1

Fish Remains from CA-Nap-261
Napa County, California

by

Peter D. Schulz

CA-Nap-261 is an archaeological site situated on the west bank of the Napa River on the northern edge of the City of Napa. Excavation by Archaeological Consulting and Research Services, Inc. for the United States Army Corps of Engineers in the fall of 1976 revealed a prehistoric occupation which is estimated to have begun in the Central California Middle Period and lasted into late prehistoric/historic times (T. Jackson, personal communication).

Excavation comprised 16.0 one by two meter excavation units dug in arbitrary 10 centimeter levels. Total volume of excavated materials was approximately 22.9 cubic meters, all of which was passed through 3 millimeter or 6 millimeter mesh screens. All bone was saved and cleaned, and submitted to the author. Fish bone was separated from other faunal material and analyzed to species whenever possible.

Results

A total of 91 fish bones was recovered from the site. Of these, 61 elements were identifiable and represent a minimum of 14 individuals of 10 species (Tables 1 and 2). All are native forms except the brown bullhead (*Ictalurus nebulosus*), which was introduced to central California from the eastern United States in 1872. Its presence at a depth of 30-40 centimeters may be taken as evidence of disturbance of the site during historic times.

Discussion

The general environmental significance of the native species has been discussed elsewhere (Schulz and Simons 1973; Moyle and Nichols 1973; Moyle 1976). The fauna is too small to present much of an indication of lotic *vs.* lentic conditions, although the more common representation of suckers (*Catostamous occidentalis*) and squawfish (*Ptychocheilus grandis*) would seem to favor the former.

An aspect of the Nap-261 environment which is of some interest is the salinity of the river during aboriginal occupation of the site. Today, tidal influence on the river at the site is marked, and typical estuarine species, such as the staghorn sculpin (*Leptocottus armatus*)

and yellowfin goby (*Acanthogobins flavimanus*), are common as are freshwater forms such as carp (*Cyprinus carpio*) (author's collection records). Of the native midden species, squawfish and suckers are still present, as are splittails which occur in considerable numbers in the even more brackish waters of Napa Marsh (Corps of Engineers 1975; Moyle 1976). Sturgeon also occur in limited numbers in the lower part of the river, but probably no longer ascend as far as the site.

During prehistoric times, however, this section of the river may have been even less brackish than it is today. During Middle Period times (ca. 2000 B.P.) mean sea level in southern San Francisco Bay is estimated to have been 2.5 to 3 meters lower than modern levels (Atwater, Heidel and Helley 1977). If this is accurate for the northern bay it would certainly have affected river salinity at the site. Nonetheless, the abundance of bay mussel (*Mytilus edulis*) shells in the midden (T. Jackson, personal communication) strongly suggests that estuarine conditions were present during the occupation period.

Also of interest is the absence of steelhead (*Salmo gairdneri*) remains from the fauna. Today, spawning runs of this fish from December to March provide the most important fishery on the river; a situation which no doubt existed prehistorically as well. Absence of this important food fish from the midden, in addition to the paucity of the recovered fauna, suggests that fishing was a minor activity at the site, and perhaps it was not occupied during the winter.

Table 1

Species	Common Name	Elements	Individuals
Acipenser sp.	Sturgeon	23	1
Catostomus occidentalis	Sacramento Sucker	18	3
Ptychocheilus grandis	Sacramento Squawfish	9	3
Pogonichthys macrolepidotus	Splittail	2	1
Orthodon microlepidotus	Blackfish	1	1
Lavinia exilicauda	Hitch	1	1
Gila crassicauda	Thicktail Chub	4	1
Mylopharadon conocephalus	Hardhead	1	1
Ictalurus nebulosus	Brown Bullhead	1	1
Archoplites interruptus	Sacramento Perch	1	1
		61	14

Table 2: CA-Nap-261 - Provenience of Fish Remains

Unit	Depth (cm.)	Material
N100/E102	40-50	*Acipenser* sp. R. subopercle frag., 2 dermal scutes
	50-60	Cyprinidae, L. cleithrum frag.
(Feat. 1)	50-70	*Acipenser* sp. skull vault frag.
	60-70	Cyprinoidea thoracic vertebrae
	80-90	*Catostomus occidentalis* R. pleural rib IV
N102/E94	40-50	Cyprinoidea thoracic vertebrae *Catostomus occidentalis* L. cleithrum
	50-60	*Acipenser* sp. dermal scute *Ptychocheilus grandis* R. dentary *Archoplites interruptus* L. cleithrum
N106/E102	40-50	*Acipenser* sp. 2 dermal scutes Cyprinoidea 2 thoracic and 4 caudal vertebrae *Pogonichthys macrolepidotus* R. pharyngeal
N107/E98	30-40	*Catostomus occidentalis* paraspenoid, L. dentary, L. interoperde
	40-50	*Acipenser* sp. 2 dermal scutes Cyprinoidea 3 thoracic and 1 cuadal vertebrae *Catostomus occidentalis* *Ptychocheilus grandis* L. and R. pharyngeal* *Pogonichthys macrolepidotus* basioccipital *Orthodon microlepidotus* R. hyomandibular
(* 2 individuals)		
	50-60	*Acipenser* sp. dermal scute, hyal arch frag. *Catostomus occidentalis* R. pelvis *Lavinia exilicauda* L. frontal
	60-70	*Acipenser* sp. 2 dermal scutes Cyprinoidea 3 caudal vertebrae *Catostomus occidentalis* L. dentary, R. ceratohyal, L. tripus, 2 R. coracoids *Ptychocheilus grandis* R. dentary *Gila crassicauda* L. pharyngeal Cyprinidae R. peropercle
	70-80	Cyprinoidea thoracic vertebrae

Unit	Depth (cm.)	Material
N107/E100	30-40	Cyprinoidea caudal vertebrae *Catostomus occidentalis* L. cleithrum
	50-60	Cyprinoidea 2 thoracic vertebrae *Ptychocheilus grandis* L. preopercle *Mylopharadon conocephalus* R. pharyngeal
	70-80	Cyprinoidea caudal vertebrae *Ptychocheilus grandis* L. dentary
	80-90	*Acipenser* sp. dermal scute
	90-100	*Acipenser* sp. 2 skull vault frags.
N107/E102	60-70	*Catostomus occidentalis* R. opercle, 2 L. cleithra *Ptychocheilus grandis* R. dentary
	70-80	Cyprinoidea caudal vertebrae *Catostomus occidentalis* 2 L. opercles
(Feat. 1)	70-100	*Ptychocheilus grandis* R. epihyal cf. *Gila crassicauda* R. opercle
	80-90	*Acipenser* sp. 2 dermal scutes *Catostomus occidentalis* R. pleural rib IV cf. *Gila crassicauda* L. opercle
	90-100	*Acipenser* sp. 3 dermal scutes cf. *Gila crassicauda* R. cleithrum
	100-110	*Acipenser* sp. dermal scute
N111/E123	20-30	Cyprinidae 2 vertebrae I
	30-40	*Ictalurus nebulosus* R. cleithrum
	40-50	*Acipenser* sp. dermal scute Cyprinoidea thoracic and caudal vertebrae *Catostomus occidentalis* R. ceratohyal, L. articular *Ptychocheilus grandis* L. pharyngeal

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Appendix 2

Vertebrate Remains from CA-Nap-261: Reptiles, Birds, Mammals

by

Dwight D. Simons

CA-Nap-261 is an archaeological site located on the west bank of the Napa River on the northern edge of Napa, California. During the fall of 1976 the site was excavated by Archaeological Consulting and Research Services, Inc. for the United States Army Corps of Engineers. Excavation results appear to indicate a prehistoric occupancy beginning sometime during the Central California Middle Period and lasting into late prehistoric/historic times (T. Jackson, personal communication).

Some 16.0 one by two meter excavation units were excavated in arbitrary 10 centimeter levels. A total volume of approximately 22.9 cubic meters of material was recovered and passed through 3.0 mm. or, 6.0 mm. mesh screens. All bone encountered was saved, cleaned and submitted to the author for identification and analysis. Terrestrial vertebrate remains were segregated into their respective classes and identified to species level whenever possible.

Results

A total of 123 identifiable terrestrial vertebrate bones were recovered from CA-Nap-261. These represented a minimum of 19 individuals belonging to 13 taxa (Tables 1 through 4). All of the taxa are native forms found in the vicinity of CA-Nap-261 today. No introduced, extirpated or extinct taxa were encountered.

Discussion

Suitable habitat for all of the taxa occurring at CA-Nap-261 would probably have been found in the immediate vicinity of the site. The riparian vegetation along the Napa River would have provided cover for mule deer and raccoons. The river and its shoreline would have made a suitable home for turtles and waterfowl. The logomorphs and rodents could have occupied a variety of biotic communities, including grassland, chaparral or foothill woodland. The latter two communities also would have been preferential mule deer habitat.

Of the terrestrial vertebrate taxa represented at CA-Nap-261, the remains of the snake, passerine bird, mole, pocket gophers, deer mouse

and meadow mouse probably represent animals living on or near the site who died of natural causes and whose remains ultimately were included in the midden through the agency of natural depositional processes. This contention is strengthened by the observation that none of the elements belonging to these taxa exhibit signs of cultural modification such as deliberate bone breakage or burning.

The remaining taxa, Pacific pond turtle, goose, large/medium-sized members of the genus *Anas*, black-tailed hare, ground squirrel, raccoon and mule deer, most likely are the remains of animals exploited for food, hides, bone, sinew, etc. by the prehistoric human occupants of the site. In partial support of this contention, Driver (1936: 184-186), McClellan (1953:236) and Chard (1953:244) note that all of these taxa were exploited by the ethnographically-known Wappo within whose territory CA-Nap-261 is situated (after Heizer 1953). Hunting techniques varied. Turtles were taken by hand. Geese and ducks were killed using slings, but were not netted as they were by other Central California groups. Rabbits were driven along brush fences and clubbed, snared, shot with bows and arrows or impaled on sticks thrust into their burrows. Ground squirrels were also clubbed, shot or impaled upon sticks. Raccoons were snared.

Deer were reportedly either driven along brush fences to waiting hunters, captured by snares placed in their trails or stalked by individuals wearing stuffed deer-head disguises who imitated the movements and sounds of their prey. Deer were dispatched by clubbing them to death or shooting them with bows and arrows. Once killed, a deer was butchered on the spot and equally divided among the hunters. The existence of such buthering practices at a prehistoric hunting camp in Hill Patwin territory has recently been inferred (Hammond 1977). However, this by no means suggests that this practice also occurred at CA-Nap-261 whose small sample size of deer remains prevents verification of hypotheses concerning prehistoric butchering techniques.

Comparison of the faunal assemblage from CA-Nap-261 with those form other sites in the Napa Valley yields interesting results. Heizer (1953:255) presents a qualitative analysis of animal bone from five archaeological sites in the area. Of particular interest are the remains from CA-Nap-14 which is situated approximately 750 meters upstream from CA-Nap-261. In his report, Heizer observes that tule elk (*Cervus elaphus*) and waterfowl bones were "very abundant" at CA-Nap-14. In contrast, no remains of tule elk were encountered at CA-Nap-261 and waterfowl remains were uncommon. These differences in the faunal assemblages between these two sites which are in such close proximity to one another are intriguing. They suggest that each site probably played a different role in the exploitation of the animal resources of the southern Napa Valley. However, in the

absence of an adequate sample of quantitative faunal data from each site, the nature of these differences cannot be established with any degree of precision.

Table 1: Raw Element Counts and Minimum Numbers of Individuals for All Identifiable Terrestrial Vertebrate Taxa - CA-Nap-261

Taxa	Elements	Individuals
REPTILES		
Pacific Pond Turtle (*Clemmys marmorata*)	8	1
Snake (Serpentes)	1	1
BIRDS		
Goose (*Anser* sp.)	3	1
Mallard-Gadwall-Pintail-Baldpate-Shoveller (*Anas* sp.)	4	1
Passerine bird	4	1
MAMMALS		
Broad-Handed mole (*Scapanus latimanus*)	1	1
Black-Tailed hare (*Lepus californicus*)	1	1
Beechey Ground Squirrel (*Otospermophilus beecheyi*)	1	1
Botta Pocket Gopher (*Thomomys bottae*)	29	4
Deer Mouse (*Peromyscus* sp.)	2	1
California Meadow Mouse (*Microtus californicus*)	1	1
Raccoon (*Procyon lotor*)	1	1
Mule Deer (*Odocoileus hemionus*)	67	4*
	123	19

Table 2: Provenience of Vertebrate Remains - REPTILE - CA-Nap-261

Unit	Depth (cm.)	Material
N102/E94	40-50	*Clemmys marmorata* 1 frag. carapace-plastron
N106/E102	40-50	Serpentes 1 vertebrae
N107/E92	10-20	*Clemmys marmorata* 1 frag. carapace-plastron
	30-40	*Clemmys marmorata* 2 frag. carapace-plastron
N107/E98	50-60	*Clemmys marmorata* 2 frag. carapace-plastron
N107/E100	10-20	*Clemmys marmorata* 1 frag. carapace-plastron
	60-70	*Clemmys marmorata* 1 frag. carapace-plastron

* 3 adult and 1 juvenile individuals

Table 3: Provenience of Vertebrate Remains - BIRD - CA-Nap-261

Unit	Depth (cm.)	Material
N100/E102	50-60	*Anser* sp. 1 proximal R. humerus
	70-80	*Anas* sp., (large) 1 L. carpometacarpus, 1 L. proximal femur
N100/E102	80-90	*Anser* sp. 1 distal L. humerus
N106/E102	40-50	Anatidae 1 sternum frag.
N107/E96	30-40	*Anser* sp. 1 distal L. tibiotarsus
N107/E98	40-50	Anatidae 1 distal R. ulna
N107/E100	50-60	Passerine bird 1 distal L. tibiotarsus
	60-70	Passerine bird 1 proximal R. ulna, 1 R. coracoid, 1 proximal L. tibiotarsus
	80-90	*Anas* sp. (large) 1 distal L. tibiotarsus
N107/E102	70-80	*Anas* sp. (large) 1 proximal R. humerus

Table 4: Provenience of Vertebrate Remains - MAMMAL - CA-Nap-261

Unit	Depth (cm.)	Material
N100/E102	30-40	*Thomomys bottae* 1 R. mandible w/out teeth, 1 proximal L. femur, 1 distal R. femur; *Odocoileus hemionus* 1 molar frag., 1 L. calcaneus w/ butchering marks on distal end; *Otospermophilus beecheyi* 1 distal R. femur
	40-50	*Odocoileus hemionus* 1 frag. L. mandible-front portion w/ butchering marks on outside face, 1 whole 2nd phalanx (burnt) w/ butchering marks
	50-60	*Odocoileus hemionus* 1 proximal end and shaft of a medipodial
	50-70 (Feat. 1)	*Odocoileus hemionus* 1 distal L. humerus, 3 frags. of a 1st phalanx w/ possible butchering marks, 1 distal 2nd phalanx
	70-80	*Odocoileus hemionus* 1 maxilla frag. w/ 3 cheek teeth
	80-90	*Odocoileus hemionus* 1 1st phalanx w/out proximal epiphysis - probable juvenile, 1 whole 2nd phalanx w/ possible butchering marks
N102/E88	30-40	*Odocoileus hemionus* 1 R. calcaneus
	40-50	*Odocoileus hemionus* 2 frags. distal R. tibia w/ butchering marks
N102/E94	30-40	*Odocoileus hemionus* 1 whole 1st phalanx w/ possible butchering marks
	40-50	*Scapanus latimanus* 1 whole R. humerus *Odocoileus hemionus* 1 molar/premolar frag.
N106/E85½	40-50	*Odocoileus hemionus* 3 frags. distal condyle of a metapodial

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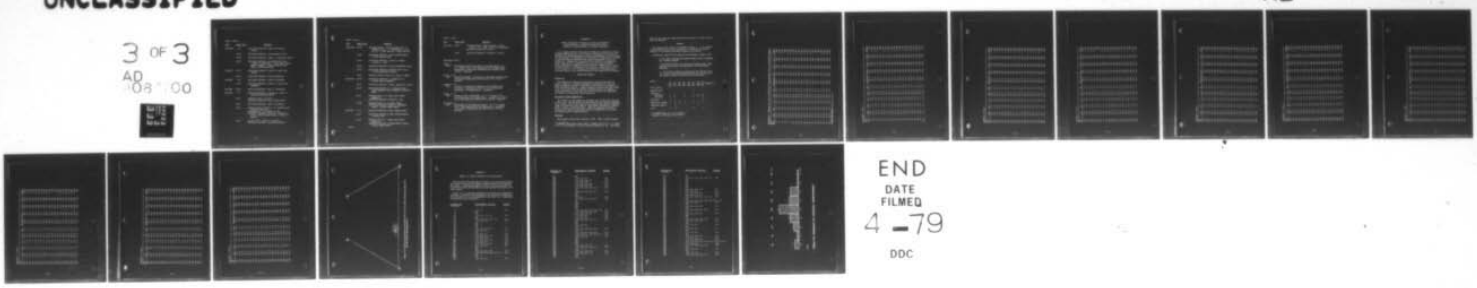

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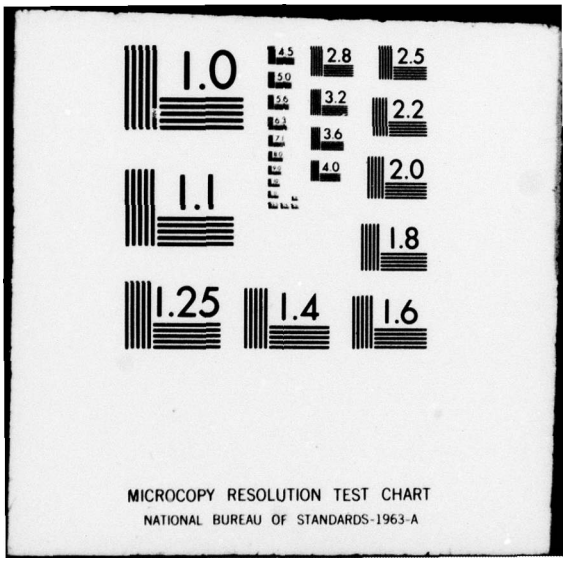
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Table 4 (cont.)

Unit	Depth (cm.)	Material
N106/E102	0-10	*Odocoileus hemionus* 1 whole 3rd phalanx (burnt)
	10-20	*Odocoileus hemionus* 1 molar/premolar frag.
	30-40	*Odocoileus hemionus* 1 whole L. astragalus (burnt)
	40-50	*Odocoileus hemionus* 1 molar/premolar frag., 2 frags. L innominate, 1 frag. distal metapodial condyle, 1 distal metapodial and shaft w/ butchering marks
N107/E92	20-30	*Odocoileus hemionus* 1 distal L. femur frag. (burnt)
	50-60	*Odocoileus hemionus* 1 distal metapodial
N107/E94	0-10	*Odocoileus hemionus* 1 whole 3rd phalanx
	10-20	*Odocoileus hemionus* 1 distal R. tibia w/out epiphysis
N107/E96	30-40	*Lepus californicus* 1 frag. R. innominate
N107/E98	35	*Odocoileus hemionus* 1 proximal L. tibia w/ possible butchering marks
	40-50	*Thomomys bottae* 2 incisors; *Odocoileus hemionus* 1 whole carpal-tarsal
	50-60	*Odocoileus hemionus* 1 whole 1st phalanx
	60-70	*Thomomys bottae* 1 incisor, 1 L. humerus w/out proximal epiphysis; *Peromyscus* sp. 1 L. mandible w/ M_1; *Odocoileus hemionus* 1 distal R. radius and shaft, 1 whole carpal-tarsal, 1 whole 2nd phalanx
	70-80	*Procyon lotor* 1 whole R. calcaneus; *Odocoileus hemionus* 1 proximal metapodial

Table 4 (cont.)

Unit	Depth (cm.)	Material
N107/E100	10-20	*Thomomys bottae* 1 maxilla-premaxilla, 1 R. mandible w/ M_3, 1 L. mandible w/ I_1, P_1, M_1, M_2, 1 lower incisor, 2 upper incisors
	30-40	*Odocoileus hemionus* 1 frag. premolar/molar, 1 whole carpal-tarsal
	40-50	*Odocoileus hemionus* 1 distal R. radius, 1 distal L. tibia
	50-60	*Odocoileus hemionus* 1 distal metapodial (burnt)
	60-70	*Odocoileus hemionus* 1 premolar/molar frag., 1 distal metapodial (burnt)
	70-80	*Thomomys bottae* 1 skull w/ 3 molars, 1 molar
N107/E102	30-40	*Odocoileus hemionus* 1 L. humerus w/ an unfused distal epiphysis
	40-50	*Odocoileus hemionus* 2 frags. proximal R. radius
	60-70	*Odocoileus hemionus* 1 R. calcaneus w/out fused epiphysis and w/ possible butchering marks
	80-90	*Thomomys bottae* 1 L. femur w/out distal epiphysis; *Odocoileus hemionus* 1 distal R. tibia
	90-100	*Thomomys bottae* 1 L. proximal femur; *Odocoileus hemionus* 1 whole L. astragalus (burnt), 1 whole carpal-tarsal
N111/E123	0-10	*Odocoileus hemionus* 1 frag. carpal-tarsal
	20-30	*Odocoileus hemionus* 4 frags. premolar/molar, 1 cranial frag.
	30-40	*Thomomys bottae* 1 L. femur w/out distal epiphysis; *Odocoileus hemionus* 2 premolar/molar frags., 1 whole carpal-tarsal

(cont.)

Table 4 (cont.)

Unit	Depth (cm.)	Material
N111/E123	40-50	*Thomomys bottae* 1 upper incisor, 1 lower incisor, 1 R. femur w/out distal epiphysis; *Microtus californicus* 1 molar
	50-60	*Odocoileus hemionus* 1 proximal L. radius

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Appendix 3

Sample Extraction and Counts of Fossil Palynomorphs from CA-Nap-261: Tentative Evaluation of any Evidence of Environmental or Cultural Conditions*

Soil samples collected from unit N102/E88 were submitted to Pollen Research Associates, Inc. of San Mateo, California, for analysis to determine the presence/absence of fossil palynomorphs and to determine the feasibility of undertaking such studies on a larger scale in order to gain information concerning the paleo-environmental setting of CA-Nap-261. Samples were collected in the field at the excavation levels from the 10-20 centimeter level to the 70-80 centimeter level (comprising 6 samples) with an additional sample from the 60-70 centimeter level in association with a mortar. Samples were collected in a manner so as to minimize the possibility of contamination by modern pollens, were double-bagged and then submitted for analysis.

Laboratory Methods

Extraction

Each sample was mixed and approximately 20 grams selected for pollen extraction. Standard laboratory procedures were utilized. These procedures included a hydrochloric acid wash for carbonate removal and deflocculation, a double screening through #100 mesh sieves, a hot nitric acid bath and potassium hydroxide wash for humates, a 24-hour hydrofluoric acid wash for silicate removal and acetolysis for removal of extraneous organic materials.

Microscopic Slide Preparation

The residue of each sample was decanted into 2-dram vials and spun at 500 r.p.m. The supernate was then drawn-off with Pasteur pipettes. After careful mixing, two drops of each sample were placed on seperate slides, stained with Basic Fuchsin, mixed with glycerine and protected by a 22 mm x 40 mm coverglass. These wet mountings allow the fossil pollen grains to be rolled over for examination of sculpturing details used in indentification.

Counting

The prepared slides were scanned at 100X. When a stained organic

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* Prepared from letter report dated 11 August 1977 by Mr. J. R. Batch (M.A.), Vice President of Pollen Research Associates, Inc., San Mateo.

particle was observed, magnification was increased to 400X to determine its identity.

Results

The fossil pollen record is recorded in Table 1. In all samples the palynomorphs were poorly preserved, as indicated by surface abrasion of sculpturing and heavy folding of the grains.

Significant results of the analysis as revealed in Table 1 are:

1. The types of pollen and spores change little throughout the interval sampled;

2. The samples taken at the 60-70 centimeter level, both adjacent to and away from the mortar, are essentially identical;

3. The minimal number of preserved pollen grains in the soil samples from CA-Nap-261 precludes the possibility of any paleo-ecological reconstruction using pollen.

Table 1

	10-20	20-30	30-40	40-50	50-60*	60-70	60-70**	70-80	(depth cm.)
Pinus (pine)	1								
Quercus (oak)						1			
Compositae									
high-spine	2	6		3		7	8	8	
low-spine	2	2		3		2	3	5	
Cheno-Am	2	1						1	
Cyperaceae (sedge)	7	9	3	3		4	5	5	
Gramineae (grass)		2							
Fern	1	2				1		1	

* no sample from this level analyzed
** sample in association with mortar

Appendix 4: Summary of X-ray Fluorescence Spectrography Data for Obsidian Samples

Cat. No.*	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
1	13.1	1.0	8.2	26.8	0.2	40.9	.320	.024	.655	.999
2	17.0	1.5	5.8	27.6	1.7	46.1	.369	.032	.599	1.000
5	15.5	0.5	4.4	23.4	1.0	39.4	.393	.013	.594	1.000
6	18.3	1.4	7.6	29.7	0.2	49.4	.370	.028	.601	.999
8	15.3	2.3	6.1	25.6	1.7	43.2	.354	.053	.593	1.000
9	19.0	1.5	7.1	31.7	3.4	52.5	.364	.029	.607	1.000
11	16.0	1.0	6.8	30.8	1.1	47.8	.335	.021	.644	1.000
12	14.8	0.0	4.0	29.0	2.6	43.8	.338	.000	.662	1.000
13	15.0	0.5	3.4	25.5	2.7	41.0	.366	.012	.622	1.000
14	13.3	1.1	8.6	26.0	2.7	40.4	.329	.027	.644	1.000
16	14.4	1.0	4.3	22.2	1.5	37.6	.383	.027	.590	1.000
18	15.4	1.8	5.6	25.7	0.6	42.9	.359	.042	.599	1.000
20	16.6	1.1	3.0	29.0	2.0	46.7	.355	.024	.621	1.000
27	17.2	1.0	6.4	27.3	1.7	45.5	.378	.022	.600	1.000
28	10.5	1.8	6.7	20.2	1.5	32.5	.323	.055	.621	.999
33	13.9	0.0	5.9	25.6	2.3	39.5	.351	.000	.648	.999
35	12.6	0.0	4.5	22.0	3.1	34.6	.364	.000	.636	1.000
36	16.8	1.6	4.6	28.7	1.5	47.1	.357	.034	.609	1.000
37	15.4	1.8	6.3	24.8	0.7	42.0	.367	.043	.590	1.000
43	17.0	1.0	6.6	29.8	0.3	47.8	.356	.021	.623	1.000

* Catalogue Number Prefix is 77-14-

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
47	18.0	1.0	5.4	28.2	0.3	47.2	.381	.021	.597	.999
48	15.6	2.0	5.8	26.6	2.4	44.2	.353	.045	.602	1.000
52	19.0	1.0	4.9	27.5	2.0	27.5	.400	.021	.579	1.000
53	17.3	2.2	5.5	27.4	1.2	46.9	.369	.047	.584	1.000
57	16.0	1.1	4.5	28.8	2.1	45.9	.349	.024	.626	.999
59	19.0	0.8	5.2	25.8	0.5	45.6	.417	.017	.567	1.001
62	17.0	2.0	4.9	25.3	2.5	44.3	.384	.045	.571	1.000
63	12.7	1.7	4.0	24.7	5.8	39.1	.325	.043	.632	1.000
65	19.8	1.8	5.7	28.7	1.1	50.3	.394	.036	.571	1.001
66	18.0	0.5	6.0	29.4	1.8	47.9	.376	.010	.614	1.000
75	11.0	0.0	8.0	25.3	0.0	36.3	.303	.000	.697	1.000
76	11.7	0.0	2.0	27.7	3.5	39.4	.297	.000	.703	1.000
77	18.0	1.8	7.4	29.6	0.8	49.4	.364	.036	.599	.999
78	15.0	1.8	7.8	26.7	1.3	43.5	.345	.041	.614	1.000
84	13.3	0.0	3.6	23.1	3.4	36.4	.365	.000	.635	1.000
85	14.8	3.8	9.0	28.2	0.9	46.8	.316	.081	.603	1.000
86	14.1	1.4	4.3	24.2	1.7	39.7	.355	.035	.610	1.000
94	15.0	0.5	7.1	26.7	0.0	42.2	.355	.012	.633	1.000
95	16.7	1.0	3.7	26.5	1.4	44.2	.378	.023	.599	1.000
104	16.0	1.1	5.5	28.2	1.6	45.3	.353	.024	.622	.999

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
105	13.6	1.1	3.5	26.8	1.5	41.5	.328	.026	.646	1.000
107	17.0	1.0	8.5	26.3	0.0	44.3	.384	.023	.594	1.001
109	9.9	1.0	4.4	22.3	2.5	33.2	.298	.030	.672	1.000
112	15.5	1.7	4.9	27.8	0.1	45.0	.344	.038	.618	1.000
115	14.0	1.8	4.5	25.7	3.2	41.5	.337	.043	.619	.999
118	18.0	1.0	4.9	25.0	0.5	44.0	.409	.023	.568	1.000
120	15.8	1.2	5.7	27.8	0.4	44.8	.353	.027	.620	1.000
121	19.0	1.0	3.2	24.8	1.1	44.8	.424	.022	.554	1.000
123	17.7	0.0	7.0	26.9	0.3	44.6	.397	.000	.603	1.000
126	17.4	1.3	6.2	24.7	0.5	43.4	.401	.030	.569	1.000
136	13.1	1.8	6.5	26.6	1.5	41.5	.316	.043	.641	1.000
143	15.9	0.0	8.9	27.0	0.9	42.9	.371	.000	.629	1.000
144	15.8	2.0	6.1	28.6	1.6	46.4	.340	.043	.616	.999
152	17.6	0.8	7.1	26.8	1.3	45.2	.389	.018	.593	1.000
153	14.0	1.0	7.7	29.3	1.7	44.3	.316	.023	.661	1.000
157	14.0	0.0	5.2	24.9	2.5	38.9	.360	.000	.640	1.000
160	19.0	0.0	5.2	31.5	3.1	50.5	.376	.000	.624	1.000
161	17.0	1.5	2.6	25.7	3.7	44.2	.385	.034	.581	1.000
162	14.2	0.0	4.8	25.9	4.7	40.1	.354	.000	.646	1.000
163	15.7	2.6	5.9	24.8	1.4	43.1	.364	.060	.575	.999

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
164	14.1	0.0	5.1	24.5	0.9	38.6	.365	.000	.635	1.000
165	11.0	0.0	5.8	24.0	0.0	35.0	.314	.000	.686	1.000
166	14.6	1.0	7.1	23.4	1.3	39.0	.374	.026	.600	1.000
167	15.3	0.0	4.8	28.8	0.5	44.1	.347	.000	.653	1.000
168	14.9	2.5	5.0	26.8	6.2	44.2	.337	.057	.606	1.000
170	15.8	0.0	3.8	26.5	3.1	42.3	.373	.000	.626	.999
172	12.3	1.7	7.2	27.7	0.6	41.7	.295	.041	.664	1.000
174	15.1	1.1	2.5	23.4	4.5	39.6	.381	.028	.591	1.000
175	13.2	1.5	5.1	25.1	0.7	39.8	.332	.038	.631	1.001
180	16.5	0.0	4.8	26.7	3.8	43.2	.382	.000	.618	1.000
182	15.4	0.8	6.9	28.8	2.1	45.0	.342	.018	.640	1.000
183	17.8	1.6	5.6	25.0	2.4	44.4	.401	.036	.563	1.000
187	11.6	0.0	5.6	26.3	3.5	37.9	.306	.000	.694	1.000
190	12.0	0.0	6.6	22.6	1.1	34.6	.347	.000	.653	1.000
193	20.5	0.0	5.4	26.3	2.5	46.8	.438	.000	.562	1.000
194	10.9	1.3	4.7	25.6	1.4	37.8	.288	.034	.677	.999
195	20.0	1.0	6.0	29.8	3.8	50.8	.394	.020	.587	1.001
197	16.0	1.0	7.3	23.8	0.8	40.8	.392	.024	.583	.999
199	14.1	1.0	6.2	25.5	1.4	40.6	.347	.025	.628	1.000
202	16.5	1.6	5.5	28.5	1.5	46.6	.354	.034	.612	1.000

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
223	14.2	1.7	8.1	28.3	2.2	44.2	.321	.038	.640	.999
224	17.0	2.0	7.1	28.6	4.4	47.6	.357	.042	.601	1.000
225	15.9	3.0	4.3	26.2	2.6	45.1	.352	.066	.581	.999
226	15.1	0.0	3.0	24.1	2.9	39.2	.385	.000	.615	1.000
227	16.0	0.7	3.8	24.8	2.7	41.5	.385	.017	.598	1.000
228	15.7	0.0	5.7	24.8	2.5	40.5	.388	.000	.612	1.000
229	16.1	3.0	6.8	24.5	2.7	43.6	.369	.069	.562	1.000
230	14.3	0.0	6.1	25.0	5.2	39.3	.364	.000	.636	1.000
231	13.3	1.5	5.6	24.7	1.4	39.5	.337	.038	.625	1.000
232	15.9	0.0	5.8	26.3	3.4	42.2	.377	.000	.623	1.000
233	18.0	0.0	2.4	24.0	1.6	42.0	.429	.000	.571	1.000
234	14.3	2.0	4.4	25.1	1.1	41.4	.345	.048	.606	.999
235	17.5	1.0	2.0	26.5	2.2	45.0	.389	.022	.589	1.000
236	12.4	0.0	7.1	28.0	0.6	40.4	.307	.000	.693	1.000
237	17.5	0.0	3.2	24.0	4.1	41.5	.422	.000	.578	1.000
238	16.0	0.0	4.1	24.1	0.0	40.1	.399	.000	.601	1.000
239	14.0	0.0	4.8	24.9	1.5	38.9	.360	.000	.640	1.000
240	15.0	2.0	6.0	22.8	2.6	39.8	.377	.050	.573	1.000
241	15.2	0.0	3.3	26.8	0.7	42.0	.362	.000	.638	1.000
242	16.0	1.7	4.2	26.3	5.1	44.0	.364	.039	.598	1.001

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
243	15.8	2.0	5.5	23.6	1.0	41.4	.382	.048	.570	1.000
244	14.8	1.2	7.7	25.7	2.0	41.7	.355	.029	.616	1.000
245	14.2	0.0	6.7	22.5	0.0	36.7	.387	.000	.613	1.000
246	14.0	0.0	3.2	22.0	2.7	36.0	.389	.000	.611	1.000
247	14.8	0.0	6.0	23.0	3.3	37.8	.391	.000	.608	.999
248	16.0	1.0	4.1	23.2	2.6	40.2	.398	.025	.577	1.000
249	14.6	1.3	5.3	26.7	4.1	42.6	.343	.030	.627	1.000
250	16.6	2.9	6.2	20.6	1.9	40.1	.414	.072	.514	1.000
251	16.8	0.0	5.0	27.0	2.3	43.8	.384	.000	.616	1.000
252	17.7	2.0	2.6	23.5	4.7	43.2	.410	.046	.544	1.000
253	14.6	0.0	7.1	25.0	0.3	39.6	.369	.000	.631	1.000
254	19.2	1.2	5.9	28.3	4.0	48.7	.394	.025	.581	1.000
255	16.0	0.0	4.4	28.0	3.4	44.0	.364	.000	.636	1.000
256	12.7	0.0	1.9	23.7	1.1	36.4	.349	.000	.651	1.000
257	15.0	0.0	4.7	23.0	3.6	38.0	.395	.000	.605	1.000
258	15.9	0.0	4.6	28.8	0.8	44.7	.356	.000	.644	1.000
259	14.0	0.0	3.2	21.1	4.3	35.1	.399	.000	.601	1.000
260	18.4	1.5	6.3	23.6	2.4	43.5	.423	.034	.542	.999
261	13.5	1.5	4.4	22.7	2.8	37.7	.358	.040	.602	1.000
262	16.8	0.0	5.5	24.9	2.6	41.7	.403	.000	.597	1.000

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
263	17.1	3.1	7.1	26.4	3.3	46.6	.367	.066	.566	.999
264	16.0	2.0	2.8	25.5	2.0	43.5	.368	.046	.586	1.000
265	18.0	2.6	4.0	26.3	4.0	46.9	.384	.055	.561	1.000
266	15.0	1.1	5.0	24.9	1.5	41.0	.366	.027	.607	1.000
267	14.5	1.4	4.2	19.7	0.9	35.6	.407	.039	.553	.999
268	15.2	1.1	5.0	22.3	2.1	38.6	.394	.028	.578	1.000
269	15.8	2.5	2.5	24.8	1.5	43.1	.367	.058	.575	1.000
270	13.1	1.0	4.1	25.6	2.8	39.7	.330	.025	.645	1.000
271	19.1	1.1	5.2	27.0	4.5	47.2	.405	.023	.572	1.000
272	16.0	1.8	3.7	22.7	1.4	40.5	.395	.044	.560	.999
273	16.0	2.4	4.2	23.3	0.0	41.7	.384	.058	.559	1.001
274	14.8	1.0	5.0	23.0	0.9	38.8	.381	.026	.593	1.000
275	14.8	0.0	5.3	27.8	3.2	42.6	.347	.000	.653	1.000
276	15.0	0.0	3.0	23.5	2.4	38.5	.390	.000	.610	1.000
277	13.7	1.5	2.9	24.7	3.5	39.9	.343	.038	.619	1.000
278	17.5	1.0	3.8	23.0	2.3	41.5	.422	.024	.554	1.000
279	14.6	1.2	4.1	26.6	3.8	42.4	.344	.028	.627	.999
280	16.5	2.0	4.4	24.8	3.6	43.3	.381	.046	.573	1.000
281	16.6	3.0	2.7	28.7	3.1	48.3	.344	.062	.594	1.000
282	16.2	0.0	4.6	23.0	1.7	39.2	.413	.000	.587	1.000

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
283	16.0	0.8	2.6	23.8	2.5	40.6	.394	.020	.586	1.000
284	15.2	0.0	5.0	25.2	1.5	40.4	.376	.000	.624	1.000
285	16.5	1.0	1.4	28.0	4.2	45.5	.363	.022	.615	1.000
286	14.6	0.5	7.1	24.9	2.0	40.0	.365	.012	.622	.999
287	16.2	3.9	4.8	26.3	2.7	46.4	.349	.084	.567	1.000
288	15.0	2.3	6.2	23.5	4.2	40.8	.368	.056	.567	1.000
289	15.3	2.8	3.9	27.6	0.5	45.7	.335	.061	.604	1.000
290	16.8	0.0	1.2	26.1	1.8	42.9	.392	.000	.608	1.000
291	15.0	1.5	3.2	24.3	2.0	40.8	.368	.037	.596	1.001
292	17.7	1.8	3.7	23.4	1.8	42.9	.413	.042	.545	1.000
293	15.0	1.2	3.5	20.0	1.3	36.2	.414	.033	.552	.999
294	14.5	1.2	1.3	23.6	2.9	39.3	.369	.030	.600	.999
295	13.2	1.0	7.2	24.8	3.6	39.0	.338	.026	.636	1.000
296	14.5	0.5	4.4	25.1	0.9	40.1	.362	.012	.626	1.000
297	16.8	0.0	3.6	24.4	3.6	41.2	.408	.000	.592	1.000
298	15.0	1.7	4.2	26.1	4.1	42.8	.350	.040	.610	1.000
299	16.3	1.0	1.6	26.1	2.5	43.4	.376	.023	.601	1.000
300	16.3	1.0	1.6	26.1	2.5	43.4	.376	.023	.601	1.000
301	18.2	1.8	2.2	23.2	1.8	43.2	.421	.042	.537	1.000
302	20.8	2.2	5.0	27.6	2.4	50.6	.411	.043	.545	.999

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
303	14.2	0.8	6.5	26.3	3.0	41.3	.344	.019	.637	1.000
304	16.7	0.0	1.6	23.6	3.0	40.3	.414	.000	.586	1.000
305	17.8	1.0	7.8	25.0	5.2	43.8	.406	.023	.571	1.000
306	15.5	1.0	5.3	21.8	1.9	38.3	.405	.026	.569	1.000
307	15.3	2.5	6.2	24.1	2.2	41.9	.365	.060	.575	1.000
308	13.8	2.0	2.2	19.8	2.3	35.6	.388	.056	.556	1.000
309	18.7	2.8	5.1	25.4	3.0	46.9	.399	.060	.542	1.001
310	15.5	0.5	5.7	21.4	2.4	37.4	.414	.013	.572	.999
311	17.0	2.5	4.4	25.7	4.1	45.2	.376	.055	.569	1.000
312	15.8	1.4	6.7	26.6	1.3	43.8	.361	.032	.607	1.000
313	16.5	0.0	3.0	25.8	1.5	42.3	.390	.000	.610	1.000
314	16.8	1.3	8.4	25.8	1.0	43.9	.383	.030	.588	1.001
315	15.8	1.0	5.1	25.8	5.5	42.6	.371	.023	.606	1.000
316	16.6	1.0	4.5	28.7	3.4	46.3	.358	.022	.620	1.000
317	14.3	2.3	6.4	25.0	2.8	41.6	.344	.055	.601	1.000
318	15.6	3.0	7.3	28.9	1.8	47.5	.328	.063	.608	.999
319	15.2	0.0	5.0	25.0	2.6	40.2	.378	.000	.622	1.000
320	14.4	2.0	2.6	23.6	0.0	40.0	.360	.050	.590	1.000
321	13.2	0.0	5.6	26.5	2.6	39.7	.332	.000	.667	.999
322	15.3	2.0	6.7	26.1	4.2	43.4	.352	.046	.601	.999

Appendix 4 (cont.)

Cat. No.	Rb	Sr	Y	Zr	Nb	Rb,Sr,Zr	Rb %	Sr %	Zr %	Total
323	17.1	0.0	6.7	29.0	1.6	46.1	.371	.000	.629	1.000
324	15.9	0.0	0.0	25.0	2.4	40.9	.389	.000	.611	1.000
325	16.8	0.0	3.9	28.4	2.8	45.2	.372	.000	.628	1.000
326	17.0	3.0	3.4	24.4	3.0	44.4	.383	.068	.549	1.000
327	16.0	0.0	3.9	24.0	2.6	40.0	.400	.000	.600	1.000
328	16.7	1.8	3.7	24.9	2.4	43.4	.385	.041	.574	1.000
329	14.2	1.4	5.8	23.9	2.4	39.5	.359	.035	.605	.999
330	16.2	0.0	4.0	23.5	4.9	39.7	.408	.000	.592	1.000
331	19.5	1.8	3.2	26.8	1.7	48.1	.405	.037	.557	.999
332	14.8	0.5	4.0	25.9	1.0	41.2	.359	.012	.629	1.000
333	14.7	2.0	4.4	23.1	1.4	39.8	.369	.050	.580	.999
334	17.8	2.0	6.0	25.0	2.9	44.8	.397	.045	.558	1.000
335	17.8	0.0	5.2	24.1	1.5	41.9	.425	.000	.575	1.000
336	14.5	1.0	6.4	25.5	1.4	41.0	.354	.024	.622	1.000
337	16.3	1.0	2.7	24.8	2.4	42.1	.387	.024	.589	1.000
338	17.0	2.3	4.3	24.8	1.3	44.1	.385	.052	.562	.999
339	16.2	0.7	2.0	20.8	2.1	37.7	.430	.019	.552	1.001
340	18.0	1.0	3.1	26.9	2.9	45.9	.392	.022	.586	1.000
341	18.0	0.0	3.3	27.0	1.7	45.0	.400	.000	.600	1.000
342	14.2	1.7	3.8	26.9	2.8	42.8	.332	.040	.628	1.000

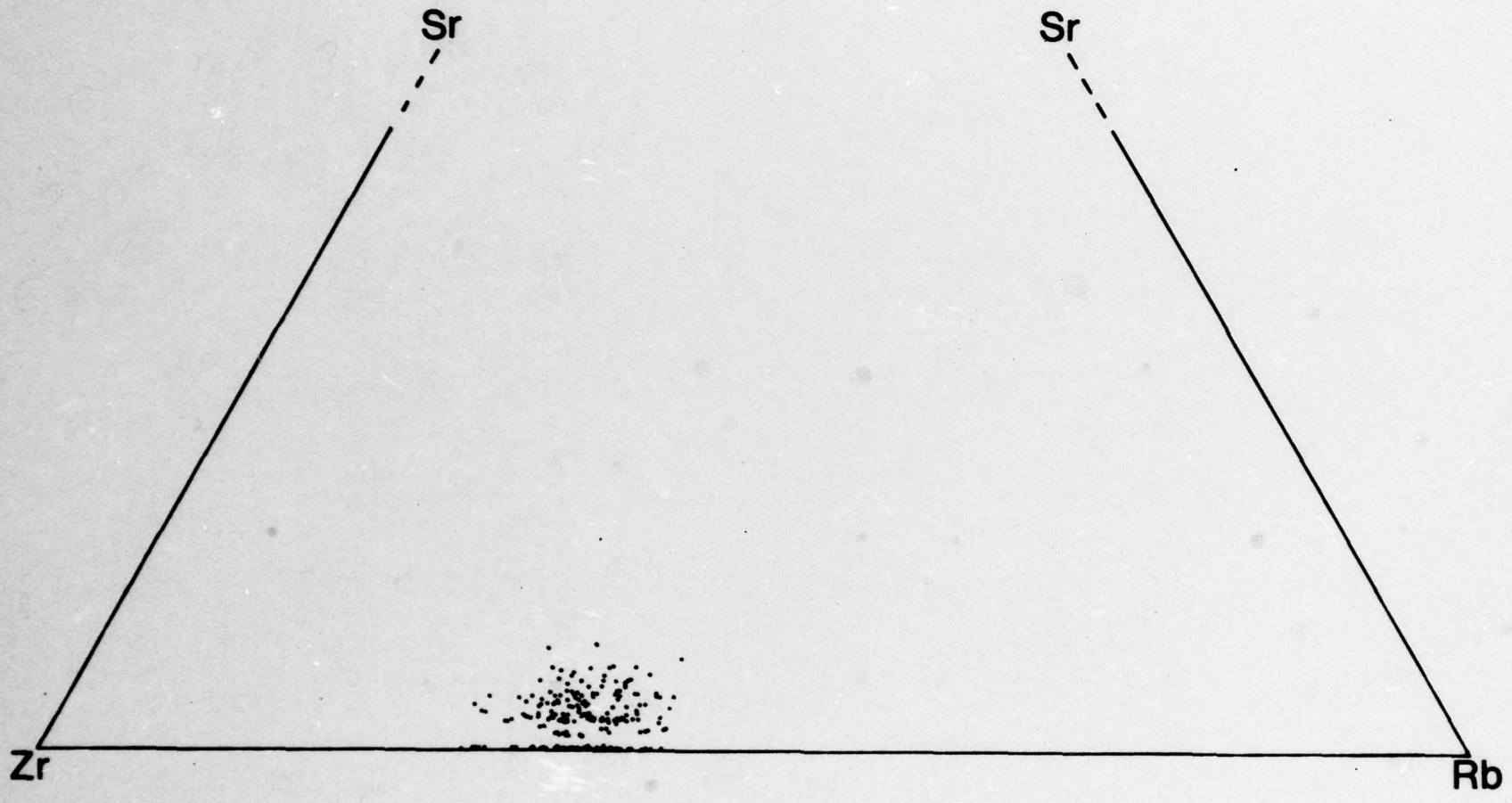


Figure 22: Each point represents the relative Sr, Zr, Rb K-alpha intensities observed for one sample (see Appendix 4).

Appendix 5

Summary of Obsidian Hydration Rim Measurements

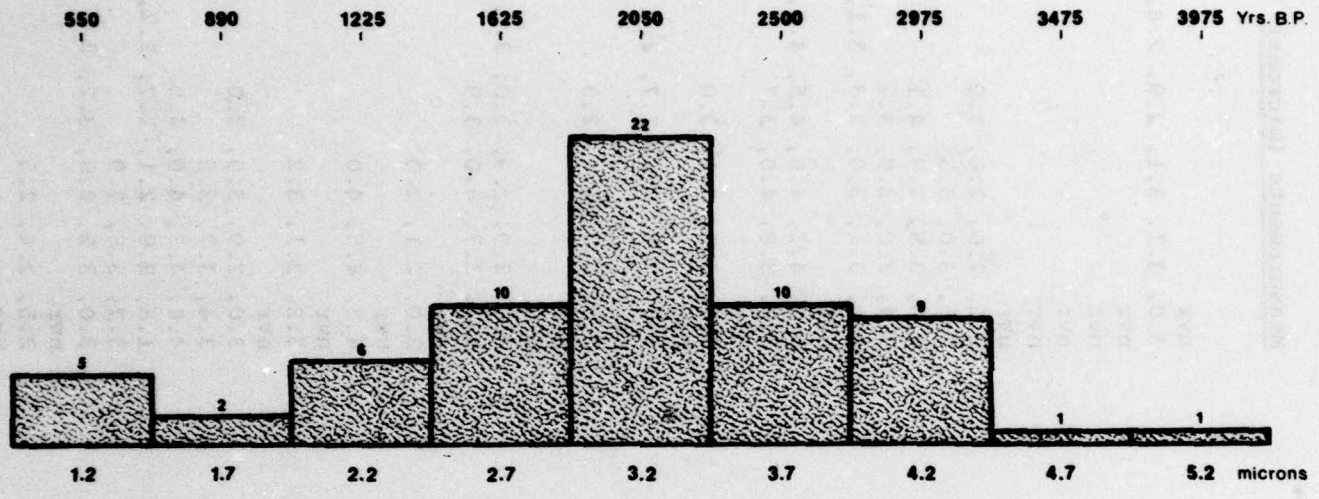
The following table provides a listing of the individual measurements made for each of the obsidian samples prepared for hydration rim studies. Measurements made on each rim are presented with the calculated average rim thickness for each specimen indicated in the final column.

Figure 23 is a histogram prepared to illustrate the distribution frequency of hydration rim measurements for specimens from Nap-261. The correlation of the class midpoints with years, B.P., equivalents is based upon Clark (1964:185).

Catalogue No. (77-14)	Measurements (microns)	Average
5	1.2, 1.2	1.2
6	nvr	
8	nvr	
10	1.1, 1.4, 1.3, 1.2	1.2
14	nvr	
16	3.0, 2.5, 2.8, 3.0, 3.0	2.9
21	1.5, 1.6, 1.5	1.5
43	nvr	
44	nvr	
47	nvr	
48	3.4, 3.6, 3.2, 3.3	3.4
50	2.7, 2.7, 2.8	2.7
52	nvr	
59	3.0, 2.9, 3.2	3.0
76	4.0, 4.3, 4.0, 4.0	4.1
77	2.5, 2.5, 2.5	2.5
106	3.1, 3.0, 3.3, 2.9	3.1
120	1.2, 1.0, 1.0	1.1
121	2.7, 2.5, 2.3, 2.2	2.4
123	3.4, 3.3, 3.3	3.3
124	nvr	
126	nvr	
152	2.7, 2.9, 2.9, 2.8	2.8
164	5.7, 5.0, 5.0, 4.8, 5.0, 5.3	5.1
168	nvr	
169	nvr	
174	1.2, 1.2, 1.2	1.2

Catalogue No. (77-14)	Measurements (microns)	Average
175	nvr	
183	3.0, 3.0, 3.0	3.0
184	1.3, 1.4, 1.2, 1.1	1.2
187	3.0, 3.0, 3.0	3.0
194	2.3, 2.4, 2.2, 2.1	2.3
195	3.0, 2.8, 2.9, 2.7	2.9
199	3.2, 3.0, 3.2, 3.0, 2.8	3.0
205	nvr	
206	4.0, 4.1, 4.2, 3.9, 3.9	4.0
234	nvr	
236	nvr	
237	2.0, 2.2	2.1
238	2.7, 2.9, 2.7, 2.9, 3.0	2.8
239	nvr	
240	nvr	
241	nvr	
242	nvr	
243	nvr	
244	3.2, 3.0, 3.4, 3.2, 3.3, 3.0	3.2
245	4.0, 3.8, 4.0, 4.2, 4.0	4.0
246	3.1, 3.4, 3.0, 3.1	3.2
247	3.0, 3.2, 3.2	3.2
248	1.7, 1.7, 1.9	1.8
249	4.1, 4.2, 4.2, 4.0, 4.1	4.1
250	nvr	
253	nvr	
254	3.5, 3.4, 3.6	
255	nvr	
256	3.9, 3.8, 3.9, 4.2, 3.9	3.9
257	nvr	
258	3.5, 3.5, 3.7, 3.5, 3.5	3.5
259	2.9, 3.0, 3.1, 2.4, 2.6, 2.8	2.8
260	4.0, 4.0, 4.2	4.1
261	nvr	
262	nvr	
263	nvr	
264	nvr	
265	3.0, 3.0, 3.2, 3.1	3.1
266	3.5, 3.2, 3.1, 3.2, 3.0	3.2
267	nvr	
268	3.8, 3.8, 4.0, 3.9	3.9
269	4.2, 4.5, 4.2, 4.0	4.2
270	nvr	
271	nvr	

Catalogue No. (77-14)	Measurements (microns)	Average
272	nvr	
273	3.0, 3.1, 3.1, 2.9, 2.8, 3.1	3.0
274	nvr	
275	nvr	
276	nvr	
279	nvr	
280	nvr	
281	2.6, 2.6, 2.6, 3.0	2.7
282	3.5, 3.0, 3.3	3.3
283	4.0, 3.8, 3.9, 4.1	4.0
284	3.4, 3.9, 3.9, 3.7	3.9
285	3.0, 3.1, 3.0, 3.3, 3.1, 2.9	3.1
286	nvr	
301	5.2, 4.3, 4.6, 4.5, 4.2, 5.0,	5.0 - 4.7
302	3.8, 3.8, 4.0, 3.7	3.8
303	nvr	
304	2.9, 3.0, 3.1, 3.0	3.0
305	nvr	
306	3.0, 3.1, 2.8, 2.7, 2.9	2.9
307	nvr	
308	2.3, 2.3, 2.4, 2.3	2.3
309	nvr	
310	nvr	
311	3.0, 2.9, 2.9, 3.0, 3.0	3.0
312	3.8, 3.7, 4.0, 3.9	3.9
329	nvr	
331	2.0, 2.1, 2.0	2.0
332	nvr	
333	4.3, 4.5, 4.0	4.3
334	nvr	
335	3.2, 3.1, 3.2	3.2
336	nvr	
337	3.0, 2.9, 3.0, 3.0	3.0
338	3.4, 3.7, 3.5	3.5
339	4.4, 4.3, 4.0, 4.5	4.3
340	1.8, 2.0, 2.1, 2.7, 2.7, 2.3, 2.3, 2.4	-2.3
341	3.7, 3.8, 3.9	3.8
342	3.0, 3.2, 2.8, 3.2, 3.0	3.0
349	nvr	
351	2.5, 2.4, 2.5	2.5
352	nvr	
353	3.0, 3.0, 3.0	3.0
359	3.6, 3.4, 3.5, 3.6, 3.3	3.5



N=66

Figure 23: Histogram for hydration measurements